DENTAL LIBRARY

FEB 10 1947

DENTAL LIBRARY

THE Journal OF THE AMERICAN DENTAL ASSOCIATION

FEBRUARY 15, 1947 • VOLUME 34 • NUMBER 4

CONTENTS

Dental Caries in Young Diabetics ..... Cohen 239
Dental Caries Activity and Nutrition ..... Mann 244
Disturbances of Temporomandibular Joint ..... Block 253
Temporomandibular Articulation ..... Gerry 261
Editorials
Prospects for Dental Legislation 270
Two Members Retire from Therapeutics Council 271
News of Dentistry 272
Committee on Nomenclature 285
Committee on International Relations 285
Bureau of Public Relations 287
Cases and Comments 289
Book Reviews 291
Current Literature 292
Army Dental Corps Separations 294
Navy Dental Corps Separations 296
Deaths 298
Directory 299
Announcements 301

The Journal of the American Dental Association, Vol. 34, No. 4. Published by the American Dental Association, 222 E. Superior St., Chicago 11, Ill. Yearly subscription $7.00 for U. S. and possessions; $8.00 for foreign countries. Single copy forty cents. Entered as second-class matter, May 27, 1942, at the postoffice at Chicago, Ill., under the act of August 24, 1942. Published semimonthly. Copyright 1947 by the American Dental Association.

THE Journal OF THE
AMERICAN DENTAL ASSOCIATION

FEBRUARY 15, 1947 • VOLUME 34 • NUMBER 4

CLINICAL STUDIES OF DENTAL CARIES SUSCEPTIBILITY IN YOUNG DIABETICS

M. Michael Cohen, D.M.D., Boston

It is reported[1-6] that diabetics who are receiving adequate dietary and insulin supervision have a decreased susceptibility to caries. The prevailing opinion is summarized by Joslin[7] as follows: "Diabetic diets of necessity include liberal amounts of fruit and vegetables and these insure an adequate intake of vitamin C. With vitamin A cared for by cream, butter, eggs, milk and vegetables in the diet and vitamin D supplied by sunlight, cod liver oil or their equivalent, all the vitamins which are considered necessary for sound dental health are furnished."

In an earlier study[8] we reported caries observations in 7 young diabetics. Of these, 6 showed a low incidence. An annual check on the dental health of this group by clinical and roentgenographic examination has made it apparent that there has been a marked increase in the susceptibility to caries.

These findings and subsequent observations indicated that there was need for further study of the relationship between diabetes and dental caries. Therefore, a survey of previous observations has been made and our own studies have been expanded.

Pre-Insulin Era

The literature that concerns diabetes and dental caries may be divided into pre-insulin and post-insulin eras.

From the Boston Floating Hospital and Tufts College Dental School, Boston.

1. Boyd, J. D. and Drain, C. L., The Arrest of Dental Caries in Childhood. J.A.M.A. 90:1867 (June 9) 1928.

2. Boyd, J. D., Drain, C. L., and Nelson, M., Dietary Control of Dental Caries. A.J.D. Child. 38:721 (October) 1929.

3. Boyd, J. D., Long Term Prevention of Tooth Decay Among Diabetic Children. A.J.D. Child. 66:349 (October) 1943.

4. Joslin, E. P., *Treatment of Diabetes Mellitus.* Philadelphia: Lea and Febiger, 1935, pp. 461-469.

5. Stein, George, *Uber Schaden des Milchgelusses und ihre klinische Bedeutung.* Wien: Medizinische Wochenschrift, 1935, p. 830.

6. Kent, H. A., Dental Service for Diabetics. N.Y. J. Med. 33:1083 (September 15) 1933.

7. Joslin, E. P., Root, H. F., White, P., and Marble, A., *Treatment of Diabetes Mellitus.* Philadelphia: Lea and Febiger, 1940, p. 679.

8. Rudy, A., and Cohen, M. M., Oral Aspects of Diabetes Mellitus. N.E.J. Med. 219:503 (October 6) 1938.

In 1882, Magitot[9] stated that the teeth of the diabetic showed an unusual susceptibility to caries which actually melted away tooth structure leaving only ragged root stumps. Grunert,[10] in 1899, observed cervical decay with gingival recession in diabetics, while in non-diabetics, recession with exposure of the cementum was more common. He further commented that adults, formerly caries free, who suddenly evidenced a high susceptibility to caries, could be suspected of having diabetes. In 1908, Lederer,[11] who had an opportunity to examine the saliva of 158 diabetics, found acid reactions in 4 patients, alkaline reactions in 92, and neutral reactions in 8. Salivary sugar determinations for these patients showed that 85 had glucose and 73 had none. This author later assumed that the high caries incidence of diabetics was the result of fermentation caused by the glucose in the saliva.

Fleischman,[12] in 1913, asserted that the incidence of caries susceptibility of the diabetic was no different from that of a normal person. Further observations were made by Misch,[13] in 1922, who maintained that caries progressed more rapidly in diabetes. He also suggested that a general derangement of body metabolism caused a disturbance of metabolism in the dentin, enabling the decay to progress more rapidly once the enamel was penetrated.

It is a matter of interest that the dietary management of the diabetic in the pre-insulin era did not allow the ingestion of sugars or carbohydrates in any appreciable amounts. Most of the diets were high in fat, sometimes as much as 200 gm. daily. From 1914 to 1922, the undernutrition treatment of Allen[14] was used especially in juvenile diabetes. Under this regimen, the diabetic child consumed approximately 25 to 30 gm. of protein and 170 gm. of fat daily. The amount of sugar and fermentable carbohydrates consumed by diabetics during this era was almost negligible; yet the opinion prevailed that a high incidence of caries occurred in diabetics.

Post-Insulin Era

Opinion differs with regard to the relation of diabetic control and caries. In 1928, Boyd and Drain[1] published data to support the belief that proper insulin and dietary control resulted in the arrest of carious lesions of diabetics and limited the occurrence of new ones, an opinion they still maintain.

Ninety-four diabetic juveniles, aged 4 to 19, attending a camp of the New York Diabetic Association, were examined clinically by Ziskin.[15] It was found that their caries susceptibility equaled that of normal children living in the same area. No correlation was evident between caries susceptibility and the degree of dietary control.

Present Clinical Studies

All diabetics in the pediatric and diabetic clinics of the Massachusetts General Hospital, Boston, were observed and, when possible, repeated examinations were made. Similar observations were made of the diabetic children from the endocrine clinic at the Boston Floating Hospital. All the children made available for study were receiving clinical supervision and in all it was possible to observe 27 young diabetics, on 11 of whom we have been able to make repeated observations. In each instance, the age and sex and the duration of

9. Magitot, E., *Memoire sur la valeur diagnostique dans le diabete sucre de la periostite alveola-dentaire.* Academie de Medicine, 1882.

10. Grunert, A., *Krankheitserscheinungen in der Mundhole beim Diabetes.* Berlin: Verlagsanstalt, 1899.

11. Lederer, W. J., The Relationship Between Dental Systemic Disturbances. N.Y.J. Med., p. 65 (January 9) 1908.

12. Fleischman, J., Die Temporare Disposition zur Karies. Oesterr-Zeitsch. fur Stomatol. Part 5, 1913.

13. Misch, J., *Lehrbuch der Grenzgebiete der Medizin.* Leipzig: F. C. W. Vogel, 1922, Vols. 1 and 2.

14. Allen, G. M., Stillman, E., and Fitz, R., *Total Dietary Regulation in the Treatment of Diabetes.* N.Y. Rockefeller Inst. for Med. Res. 1919, Monograph 11.

15. Ziskin, D. E., Siegel, E. H., and Loughlin, W. C., Diabetes in Relation to Certain Oral and Systemic Problems. J.D. Res. 23:317 (October) 1944.

Table 1.—Present age and sex and duration of diabetes mellitus in 27 young diabetics, on 11* of whom repeated clinical and roentgenographic examinations were made

Number	Name	Present Age	Sex	Onset of Diabetes	DMF Surfaces Clinical Record	
					Past	Present
* 1	M. E.	27	M	1932	50-(1936)	148
* 2	J. C.	25	M	1933	5-(1936)	50
* 3	M. L.	23	F	1934	0-(1936)	57
4	J. B.	13	F	1934		31
* 5	J. L.	15	M	1935	5-(1936)	46
* 6	L. S.	23	F	1935	47-(1941)	53
7	A. A.	12	M	1935		5
* 8	R. D.	16	M	1936	4-(1936)	36
* 9	B. S.	26	M	1936	10-(1936)	148
10	H. P.	26	M	1936		44
* 11	M. A.	20	F	1937	24-(1941)	69
* 12	E. F.	30	F	1937	30-(1941)	46
13	R. C.	13	F	1937		0
* 14	E. B.	15	F	1938	5-(1939)	15
15	M. M.	14	F	1938		25
* 16	E. P.	29	M	1939	35-(1939)	53
17	L. B.	21	F	1941		22
18	R. C.	8	F	1941		0
19	P. F.	9	M	1941		16
20	C. G.	6	M	1941		3
21	N. M.	14	M	1941		6
22	J. H.	9	M	1942		6
23	C. D.	16	M	1943		54
24	P. D.	14	M	1944		34
25	P. D.	18	M	1944		33
26	S. W.	17	M	1944		52
27	G. N.	6	M	1945		19

diabetes were noted. The results may be seen in Table 1.

In an effort to determine the relative caries susceptibility of diabetics and non-diabetics, the experimental group was compared with normal young subjects receiving treatment at Tufts College Dental School. The results of this comparison are seen in Table 2. The data are reported in terms of DMF surfaces, since it was felt that this afforded an accurate measurement of caries incidence. It is evident from this table that these diabetics do not have a greater immunity to caries than non-diabetics. Rather, the data suggest that the reverse is true. It can also be seen in Table 2 that there was a steady increase in caries susceptibility after the age of 21.

In addition to roentgenographic and clinical examination of the compared study groups, salivary glucose analyses were made for a limited number of diabetics at Tufts College dental laboratories by the use of a modification of the method of Folin and Malmros.[16] The values for salivary glucose in 5 diabetics (between 20 to 40 mg. per cent) were comparable to those observed in normal persons.[17] In a sixth person, however, the value was greatly elevated (87 mg. per cent). In 2 persons an attempt was made to correlate blood, urine and salivary glucose levels but the results

16. Folin, O., and Malmros, H., Improved Form of Folin's Micro Method for Blood Sugar Determination. J. Biol. Chem. 83:115 (July) 1929.

17. Volker, J. and Pinkerton, D., Disappearance from the Mouth of Ingested Glucose. J.D. Res. 24:203 (August) 1945.

Table 2.—Comparison between average DMF surfaces of normal patients seen at the Tufts College Dental School and average DMF surfaces of the 27 diabetic cases in Table 1

Ages	Number of Normal Patients	Average No. DMF Teeth	Average No. DMF Teeth	Number of Diabetic Patients	Ages
6	39	1.5	10.5	2	6
7	45	2.5	—	—	7
8	49	4	0	1	8
9	44	7	11	2	9
10	53	7	—	—	10
11	29	7	—	—	11
12	34	10	5	1	12
13	30	10	15.5	2	13
14	15	12.5	22	3	14
15	9	11	12	2	15
16	4	26	35	2	16
17	3	9	42	1	17
18	8	22	33	1	18
19	45	27	—	—	19
20	56	30	69	1	20
21	68	36	22	1	21
22	68	33	—	—	22
23	35	30	55	2	23
24	14	35	—	—	24
25	7	36	50	1	25
26	4	35	96	2	26
27	2	44	148	1	27

were essentially negative. Likewise, it was not possible to show variations in salivary glucose after insulin therapy.

Since all of the subjects are seen at regular intervals at their respective diabetic clinics, it would appear that they receive medical and dietary supervision. However, those who do indulge in dietary indiscretions and insulin omissions show the greatest caries susceptibility.

Discussion

The findings in this experimental series are not in accord with those of Boyd, who is of the opinion that children maintained on diabetic diets enjoy greater freedom from caries. I feel that the possible reason for this difference of opinion may be the fact that all of his examinations were made with mirror and explorer. In my opinion, incipient interproximal caries or the depth of visible carious lesions cannot be accurately determined without the use of roentgenograms.[18,19] Another reason may be that the caries susceptibility in New England[20-22] is very different from that in Iowa. As indicated in Table 2, tooth decay in diabetes does not follow the pattern observed by Burrill,[23] who, in an examination of 3,478 normal patients, found that the greatest susceptibility to caries occurs between the ages of 13-21.

The diabetic children who are reported in this study do not have any concentrated sugar included in their diet but they are permitted to have from 150 to 300 gm. of carbohydrate daily. Since

18. White, D. P., Preliminary Bite-Wing Roentgenographic Examination of Naval Aviation Cadets. Naval Med. Bull. 43:5 (November) 1944.

19. Burket, L. W., The Accuracy of Clinical and Roentgenologic Diagnosis of Dental Caries as Determined by Microscopic Studies. J.D. Res. 20:71 (February) 1941.

20. East, B. R., Some Epidemiological Aspects of Tooth Decay. Am. J. Pub. Health 32:1242 (November) 1942.

21. Dunning, J. M., The Dental Status of Midshipmen. Naval Med. Bull. 43:895 (November) 1944.

22. Nizel, A. E. and Bibby, B. G., Geographic Variations in Caries Prevalence in Soldiers. J.A.D.A. 31:1619 (December) 1944.

23. Burrill, B. Y., Changes in Caries Susceptibility with Age and Sex. J.D. Res. 22:367 (October) 1943.

most of this group showed a high susceptibility to caries on this type of diet, it may be that carbohydrates rather than simple sugars may be concerned with the cause of caries.

The failure to find increased salivary glucose levels in certain diabetics showing the highest susceptibility to caries does not exclude the possibility that other aspects of salivary physiology may be altered during diabetes. It is conceivable that the salivary glands may be affected in diabetes and that this in turn might influence either salivary flow or some other physical or biological property[24] of the saliva that may be related to caries immunity. A parotid-pancreas relationship has been suggested by Flaum[25] and Kenawy,[26] whereas Birnkrant[27, 28] recently demonstrated it in animals. Others have reported that non-suppurative acute pancreatitis, transient glycosuria or even true diabetes may develop in children with mumps.[29-32]

Summary

The caries susceptibility of 27 young diabetics, aged 6 to 30, has been studied for an extended period. The clinical observations have been supplemented by repeated roentgenograms. Contrary to prevailing opinion, no decreased caries susceptibility could be detected in this group. Rather, there was an accelerated rate of tooth decay with advancing age. Limited information does not support the belief that there is an increased salivary glucose level in diabetics which predisposes them to increased dental caries.

It is suggested that other aspects of salivary physiology may be altered in diabetes. Further observations on the immunological properties of saliva and the possibility of a parotid-pancreas relationship may aid in evaluating the effects of diabetes on dental caries.—*520 Beacon Street.*

24. Bibby, B. G., Hine, M. K., and Clough, C. W., The Antibacterial Action of Human Saliva. J.A.D.A. & D. Cos. 25:1292 (August) 1938.

25. Flaum, E., Parotishypertrophie ein Symptom des Diabetes Mellitus. Klin. Wchnschr. 11:1704, 1932.

26. Kenawy, M. R., Endemic Enlargement of the Parotid Gland in Egypt. Tr. Roy. Soc. Trop. Med. & Hyg. 31:339 (November) 1937.

27. Birnkrant, W. B., The Influence of a Parotid Extract on the Blood Sugar and Structure of the Pancreas of the Rat. J. Lab. & Clin. Med. 27:510 (January) 1942.

28. Birnkrant, W. B., The Influence of the Parotid Gland on Blood Sugar. J. Lab. & Clin. Med. 26:1009 (March) 1941.

29. Brahdy, M. and Scheffer, I., Pancreatitis Complicating Mumps. Am. J. Med. Sc. 181:255 (February) 1931.

30. Farnam, L. W., Pancreatitis Following Mumps; Report of a Case with Operation. Am. J. Med. Sc. 163:859 (June) 1922.

31. Finizio, G., Si di un caso di steatorrea consecutiva ad orecchioni. La Pediatra. 17:674, 1909.

32. Labbe, M. and Debre, R. Diabete transitoire post-ourlieu. Bull. et Mem. Soc. Med. d'hop. de Paris. 45:1306 (July) 1921.

World Food Plans.—The Food and Agriculture Organization of the United Nations has set a 1950 goal for the United States food supply of more milk, fruits and vegetables, but less sugar, as compared with pre-war American diets. Based on a predicted 12 per cent increase in population by 1950, the U. S. goals indicate a need for 55.6 per cent more milk and milk products, including butter, 48.6 per cent more fruits and vegetables, and 17.6 per cent more meat and eggs than the nation consumed before the war.—*From Science News Letter, August 24, 1946, p. 117.*

A COMPARISON OF DENTAL CARIES ACTIVITY IN MALNOURISHED AND WELL-NOURISHED PATIENTS

Arvin W. Mann, D.D.S., Samuel Dreizen, D.D.S., Tom D. Spies, M.D. and Floy Martin Hunt, M.S., Birmingham, Ala.

THE relationship of diet to dental caries has claimed the attention of a great many investigators in the field of both nutritional and dental research for over fifty years. The material reported in the literature on this point, however, has been confused, controversial and inconsistent. This can be summed up by saying that two schools of thought have evolved, the point of contention being whether or not dental caries is a disease produced in whole or in part by a deficiency of "protective foods" or "protective food substances" in the diet.

Review of the Literature

Support for the belief that a diet adequate in all respects is essential for a reduced caries prevalence is advanced by Boyd and Drain[1] and by Boyd, Drain and Nelson[2] who, in their study of caries in diabetic children in Iowa, concluded that the improvement of the general nutritional adequacy of the diet results in a reduction of the incidence of dental caries in children. They also believed that active caries indicates the presence of moderate or severe nutritional deficiency disease. On still another occasion Boyd[3] has stated that "the most constant characteristic of the varied diet which we have found favorable for tooth preservation has been the high content of so-called protective factors . . . dietary elements which are essential both qualitatively and quantitatively for the normal growth and functions of the body and its component tissue. These diets have been based on liberal allowances of milk, eggs, vegetables and fruits and they include cod liver oil."

Howe, White and Elliott[4] were able to reduce caries activity by nutritional guidance, reporting that the progress of dental caries in children can be substantially reduced by an intensive educational program in diet and nutrition. Among the other well-known proponents of the protective food theory have been May Mellanby, E. V. McCollum and Philip Jeans. Mellanby, in collaboration with Pattison and Proud,[5] found that the diet giving the best result for decreasing the rate of initiation and spread of caries is one which is rich in both calcium and the calcifying vitamins and contains comparatively little cereal, none of which is in the form of oatmeal. This is, of course, in addition to the ordinary qualities of a normal diet. McCollum,[6] investigating

University of Cincinnati Studies in Nutrition at the Hillman Hospital, Birmingham, Ala. From the Department of Internal Medicine, University of Cincinnati.

These studies were supported by grants from the American Dry Milk Institute, Inc., and from Walker Vitamin Products, Inc.

1. Boyd, J. D. and Drain, C. L., Arrest of Dental Caries in Childhood. *J.A.M.A.* 90:1867 (June 9) 1928.

2. Boyd, J. D., Drain, C. L. and Nelson, M. V., Dietary Control of Dental Caries. *Am. J. Dis. Child.* 38:721 (October) 1929.

3. Boyd, J. D., The Role of Diet in the Control of Dentinal Caries. *J.A.D.A.* 27:750 (May) 1940.

4. Howe, P. R., White, R. L. and Elliott, M. D., The Influence of Nutritional Supervision on Dental Caries. *J.A.D.A.* 29:38 (January 1) 1942.

5. Mellanby, May, Pattison, C. L. and Proud, J. W., The Effect of Diet on the Development and Extension of Caries in the Teeth of Children. *Brit. M. J.* 2:354 (August 30) 1924.

6. McCollum, E. V., Simmonds, N., Kinney, E. M. and Grieves, C. J., Relation of Nutrition to Tooth Development and Tooth Preservation. *Bull. Johns Hopkins Hosp.* 33:202 (June 22) 1922.

the caries activity of rats, found that a variable amount of dental caries occurred in each group fed on various deficient diets, while the teeth of rats fed on a well-balanced diet were practically free from defects. The largest percentage of caries occurred if diets were low in calcium and fat soluble vitamin A. Hoppert, Webber and Caniff[7] have, however, disputed much of this work by proving that dental caries may be produced in rats by varying the coarseness of the diet. Jeans,[8] in reviewing the problem of dental caries and nutrition in 1944, concluded that the one really adequate measure for the prevention of caries is a diet complete in all nutritional essentials, and that "experimental observations have shown that prevention and arrest of enamel caries parallel arrest of dentinal caries when arrest is brought about by nutritional means."

Opposing Opinions

For every proponent of the protective food theory there has been an opponent to maintain that dietary and nutritional deficiencies of themselves do not increase caries activity. Grandison, Scott and Cruikshank[9] were able to obtain no reduction of dental caries activity from the administration of 200 mg. of synthetic vitamin C to a group of 20 children over a period of two years. Collins, Jensen and Becks,[10] in an analysis of the food intake (with regard to protein, calcium, phosphorus, carotene, thiamin, ascorbic acid and vitamin D) of 366 students, showed that these food essentials were not more deficient in the rampant caries group than in the caries free group, and not more adequate in the caries free group than in the caries active group. Robinson,[11] in a study of dental caries and the metabolism of calcium, stated that the so-called optimal diet is to be recommended for general health, but not as a caries preventive. After a diligent study and review of the literature, Rosebury[12] and Schour and Massler[13] came to the conclusion that the present evidence has not established a specific nutritional basis for dental caries and that the work thus far does not indicate that dental caries is caused by a dietary deficiency. Jay,[14] summarizing the studies of the "Michigan Group," reported that "dental caries activity is not related to the nutritional adequacy of the diet and the disease is not arrested by supplementing the diet with either mineral or vitamin preparations."

Adding to the complexities of the problem were the observations of Sandwith[15] in Egypt, Corkhill[16] in the Sudan, and Roberts[17] in this country that pellagrins have a low incidence of dental caries. These findings were substantiated by observations made in the Nutrition Clinic of the Hillman Hospital, Birmingham, Ala., by one of us[18] (A.W.M.) who, in 1940, noted that patients showing gross evidence of vitamin B complex deficiency were also relatively free from dental caries. Kniesner, Mann and Spies,[19] studying the association of vitamin B

7. Hoppert, C. A., Webber, P. A. and Caniff, T. L., Production of Dental Caries in Rats Fed Adequate Diet. *Science* 74:77 (July 17) 1931.

8. Jeans, P. C., *Maintaining Dental Health, in Implications of Nutrition and Public Health in the Post War Period.* Detroit: Children's Fund of Michigan, 1944, p. 91.

9. Grandison, W. B., Scott, L. B. and Cruikshank, D. B., Investigation into the Influence of Synthetic Vitamin C as a Controlling Factor in the Incidence of Dental Caries in Already Calcified Teeth. *Brit. D. J.* 72:237 (May) 1942.

10. Collins, R. O., Jensen, A. L. and Becks, H., Study of Caries Free Individuals. II. Is an Optimum Diet or a Reduced Carbohydrate Intake Required to Arrest Dental Caries. *J.A.D.A.* 29:1169 (July 1) 1942.

11. Robinson, H. B. G., Dental Caries and the Metabolism of Calcium. *J.A.D.A.* 30:357 (March 1) 1943.

12. Rosebury, T., The Problem of Dental Caries. Cited by Gordon, S. M., *Dental Science and Dental Art.* Philadelphia: Lea and Febiger, 1938, p. 269.

13. Schour, I. and Massler, M., The Effect of Dietary Deficiencies upon the Oral Structures. III. *J.A.D.A.* 32:1022 (August 1) 1945.

14. Jay, Philip, Lactobacillus Acidophilus and Dental Caries. *Am. J. Pub. Health* 28:759 (June) 1938.

15. Sandwith, F. M., *The Medical Diseases in Egypt.* London: H. Kempton, 1905, p. 137.

16. Corkhill, N. L., Pellagra in Sudanese Millet Eaters. *Lancet* 1:1387 (June 30) 1934.

17. Roberts, S. R., *Pellagra.* St. Louis: C. V. Mosby Company, 1915, p. 109.

18. Mann, A. W., Spies, T. D. and Springer, M., The Oral Manifestations of Vitamin B Complex Deficiencies. *J. D. Res.* 20:269 (June) 1941.

19. Kniesner, A. H., Mann., A. W. and Spies, T. D., Relationship of Dental Caries to the Deficiencies of the Vitamin B Group. *J. D. Res.* 21:259 (June) 1942.

complex deficiencies and dental caries, stressed the fact that the unusually low caries incidence could not be attributed to the presence of fluorine in the local water supply in amounts above 1 p.p.m., to exceptionally good oral hygiene, to a lack of refined carbohydrates in the dietary or to an absence of the essential nutrients required for the normal growth of the Lactobacillus acidophilus. In a previous report, Dreizen, Mann, Cline and Spies[20] have noted, however, that these nutritionally deficient patients have a greater buffer capacity in their saliva than the well-nourished patients in a control group.

This study was undertaken to determine whether the previously reported observations of the decreased caries incidence in malnourished patients could be supported by clinical and laboratory evidence and by a comparison with a corresponding group of patients free from nutritional deficiency disease.

Selection of Patients

One hundred twenty-four patients with definite clinical evidence of nutritional deficiency disease were selected for the experimental group. Clinical evidence of nutritional deficiency disease was determined from a medical examination and physical findings obtained by the physicians and dentists on the staff of the Nutrition Clinic, Hillman Hospital, Birmingham, Ala. The lesions and signs regarded as indicative of nutritional deficiencies were as follows: of vitamin A—Bitot's spots, nyctalopia or night blindness, xerophthalmia, and hyperkeratosis of the hair follicles; of vitamin B_1 (thiamin)—nutritional peripheral neuritis (calf tenderness) associated with or without edema; of vitamin B_2 (riboflavin)—angular cheilosis, so-called magenta tongue and vascular injection of the conjunctiva and the sclera of the eye accompanied by photophobia, which responded to riboflavin therapy; of niacin—pellagrous glossitis, pellagrous dermatitis and gastro-intestinal disturbances. Subclinical pellagra was suggested by the initial nervous syndrome in which the patient exhibited fatigue, insomnia, anorexia, vertigo, burning sensations in various parts of the body, numbness, palpitation, nervousness, a feeling of unrest and anxiety, headache, forgetfulness, apprehension and distractibility, and visual and auditory pseudohallucinations which were specifically relieved by niacin;[21] of vitamin C—scorbutic gingivitis characterized by reddened gingivae which bled easily when touched, subperiosteal petechial hemorrhages, ecchymosis and a lack of ascorbic acid in the plasma; of nutritional macrocytic anemia—a macrocytic anemia with a high color index in a patient who had free hydrochloric acid, pepsinogen and rennin in the gastric juice. There were no signs of rickets in any of the patients studied. (The amount of sunlight in this section of the country is high and nearly all children are exposed to it early in life.*)

Classification

Classified solely on the basis of the clinical findings, the experimental group of 124 patients included 34 patients with evidence of pellagra, 84 with riboflavin deficiency, 29 with the initial nervous syndrome, 15 with nutritional macrocytic anemia, 27 with clinical evidence of thiamin deficiency, 11 with vitamin A deficiency and 17 with clinical scurvy. Sixty-two of these patients showed clinical evidence of multiple deficiency diseases operating simultaneously, which

20. Dreizen, S., Mann, A. W., Cline, J. K. and Spies, T. D., The Buffer Capacity of Saliva as a Measure of Dental Caries Activity. *J. D. Res.* 25:213 (August) 1946.

21. Aring, C. D., Evans, J. P. and Spies, T. D., Some Clinical Neurologic Aspects of Vitamin B Deficiencies. *J.A.M.A.* 113:2105 (December 9) 1939.

*According to the Birmingham Weather Bureau, in a personal communication, Jefferson County, of which Birmingham is the county seat, has 62 to 63 per cent sunshine per year, where 100 per cent represents continual sunshine from sunrise to sunset for all 365 days of the year.

Spies, Bean and Ashe[22] have shown to be the rule rather than the exception in cases of prolonged malnutrition.

The control group of 99 patients was taken at random from the employees of the American Cast Iron and Pipe Company of Birmingham, Ala., Nutrition Clinic personnel and freshman medical students from the Medical College of Alabama. There was no clinical evidence of nutritional deficiency disease found among any of the control patients.

The 124 patients of the experimental group ranged in age from 6 to 75 years. Seventy-two of this group were in the age range from 11 to 40, the period of life in which dental caries occurs most frequently. The 99 patients of the control group had an age range from 8 to 54 years. Eighty-seven of the 99 were in the age range from 11 to 40. The experimental group contained 44 males and 80 females and the control group contained 33 males and 66 females. There were 8 Negro patients in the experimental group, and 7 Negro patients in the control group. The large majority of both groups were natives of north central Alabama.

Methods of Study

The clinical diagnosis was supplemented by blood vitamin level determinations and dietary assays. Blood level determinations of vitamins A, carotene, C, and E were obtained for all patients in the study. The methods employed were those of Kimble[23] for vitamin A and carotene, Mindlin and Butler[24] for vitamin C, and Quaife and Harris[25] for vitamin E. Dietary assays of the food intake of the malnourished patients were made and the dietary adequacy was determined from diet histories and evaluations of one week's diet records.

The dental examination of each patient consisted of a clinical examination for dental caries and periodontal disease using the mouth mirror, exploring tine and bitewing or full mouth roentgenograms. This examination was supplemented by laboratory tests for dental caries activity. Three different methods were used for this purpose. These were the methods of (a) Fosdick, Hansen and Epple,[26] based upon the chemical determination of free calcium in a sample of saliva before and after incubation; (b) Hadley,[27] in which the number of L. acidophilus per cubic centimeter of saliva is obtained; and (c) Dreizen, Mann, Cline and Spies,[20] which measures the buffer capacity of the saliva. At least two samples of saliva were analyzed in the chemical and bacteriologic tests for dental caries activity for each patient studied. The buffer capacity test was introduced late in the study and was applied, therefore, to but 16 patients in the experimental group and 91 patients in the control group.

Thirty cubic centimeters of paraffin-stimulated saliva was collected between the hours of 9 and 11 a. m. for each sample tested. One cubic centimeter of the saliva was diluted in 9 cc. of isotonic saline solution. One-tenth cubic centimeter of the resultant mixture was then plated on Kulps tomato juice agar. The Petri plate was incubated for three days at 37°C. and the number of colonies of L. acidophilus which was present at the end of this period was computed and multiplied by 100 to give the Lactobacillus count per cubic centimeter of saliva. Twenty cubic centimeters

22. Spies, T. D., Bean, W. B. and Ashe, W. F., Recent Advances in the Treatment of Pellagra and Associated Deficiencies. *Ann. Int. Med.* 12:1830 (May) 1939.

23. Kimble, M. S., Photocolorimetric Determination of Vitamin A and Carotene in Human Plasma. *J. Lab. and Clin. Med.* 24:1035 (July) 1939.

24. Mindlin, R. L. and Butler, A. M., Determination of Ascorbic Acid in Plasma—Macromethod and Micromethod. *J. Biol. Chem.* 122:673 (February) 1938.

25. Quaife, M. L. and Harris, P. L., Chemical Estimation of Tocopherols in Blood Plasma. *J. Biol. Chem.* 156:499, (December) 1944.

26. Fosdick, L. S., Hansen, H. S. and Epple, Charlotte, Enamel Decalcification by Mouth Organisms in Dental Caries: Suggested Test for Caries Susceptibility. *J.A.D.A.* 24:1275 (August) 1937.

27. Hadley, F. P., A Quantitative Method for Estimating the Bacillus Acidophilus in the Saliva. *J. D. Res.* 13:415 (October) 1933.

Table 1.—Comparison of blood vitamin level determinations in 124 malnourished and 99 well-nourished patients

Determination	Malnourished Patients		Well-Nourished Patients	
	Normal	Below Normal	Normal	Below Normal
Vitamin A....	29	95	95	4
Carotene.....	34	90	90	9
Vitamin C....	68	56	82	17
Vitamin E....	61	63	95	4

of the saliva sample was used in the chemical test for dental caries activity. Ten cubic centimeters was analyzed for soluble calcium by the method of Fosdick, Hansen and Epple. The remaining 10 cc. was incubated in a shaker apparatus which was submerged in a water bath for four hours at 37°C. The incubated tube contained dextrose and tricalcium phosphate in addition to the saliva. At the end of four hours this sample was also analyzed for soluble calcium by the method of Fosdick, Hansen and Epple. The difference between the two values, as expressed in terms of cubic centimeters of 0.01 N $KMnO_4$, established the degree of dental caries activity. Fosdick and his co-workers have proposed a classification of caries activity based upon the difference in the amounts of 0.01 N $KMnO_4$ needed to titrate the samples before and after incubation. Their classification, which ranges from negative to 4 plus, is used in this paper to denote the degree of caries activity of the saliva sample when using this test. Finally, 5 cc. of the sample was titrated against 0.1 N lactic acid to produce a titration curve. The Beckman pH meter was used to secure the pH readings. One-tenth N lactic acid was added to the sample of saliva one drop at a time from a burette calibrated to deliver 0.04 cc. per drop and a pH reading was taken after the addition of each drop. The resultant readings were used to make the titration curve. The amount of 0.1 N lactic acid required to lower the pH of the saliva from pH 7.0 to pH 6.0 was regarded as a measure of the buffer capacity of the saliva. Patients with a high buffer capacity have been found to have a low caries activity, and conversely, patients with a low buffer capacity have a high caries activity.[20]

Blood Level Findings

The blood vitamin level determinations are recorded in Table 1. The values which we arbitrarily regard as normal for these tests in the Nutrition Clinic are 200 units per cent and over for vitamin A, 190 units per cent and over for carotene, 0.4 mg. per cent and over for vitamin C, and 0.8 mg. per cent and over for vitamin E. There were only 7 patients in the experimental group of 124 who had normal levels in each of the four tests employed. Ninety-five patients were below the so-called normal level in vitamin A, 90 in carotene, 56 in vitamin C, and 63 in vitamin E.* One hundred one patients of this group had levels which were low in more than one of these nutrients. By contrast, only 4 of the control patients were below the so-called normal blood level in vitamin A, 9 in carotene, 17 in vitamin C (9 of the 17 had values between 0.30 mg. per cent and 0.40 mg. per cent), and 4 in vitamin E.

Evaluation of the diet histories taken for each of 107 malnourished patients supported the results obtained by the medical examination and the blood vitamin level determinations. There were only 8 patients whose diets were assayed as adequate in all respects. In contrast, 99 patients in this group were deficient in one or more nutrients. The dietary histories of the remaining 17 patients in this group were not considered accurate and therefore have been deleted. The accu-

*Like many investigators, we do not have a definite level at which we diagnose deficiency disease. All our diagnoses are clinical, and we use the laboratory determinations only for aid.

Table 2.—Evaluation of dietary histories of 107 malnourished patients

Nutrients	No. of Patients Deficient*	No. of Patients Borderline †	Total
Vitamin A	28	21	49
Riboflavin	37	27	64
Thiamin	39	29	68
Niacin	53	32	85
Vitamin C	33	36	69
Calcium	31	24	55
Phosphorus	29	22	51
Iron	16	16	32
Protein	33	25	58
Calories	9	7	16

*Below value recommended by National Research Council.
†Minimum value recommended by National Research Council.

Table 3.—Comparison of incidence of dental caries in well-nourished and malnourished patients

Clinical Findings	Experimental Group		Control Group	
	Total No.	Average per Patient	Total No.	Average per Patient
Tooth Surfaces Decayed (D)	257	2.07	312	3.21
Teeth Missing (M)	199	1.60	221	2.23
Tooth Surfaces Filled (F)	107	0.96	946	9.75
Total DMF	563	4.54	1479	14.94

racy of the dietary history was questioned when the patient could not give reasonably intelligent answers to the questions asked with regard to the food intake over the week period.

Nutrition Assays

Table 2 records the assays made for the nutrients evaluated in the nutrition history. An interesting observation was that only 9 of these patients were deficient and 6 were borderline in caloric intake, indicating that the carbohydrate and fat intake of these patients paralleled that of the well-nourished group. This may perhaps be explained on the basis of economics. The income of the patients in the experimental group was such that they could afford little else but corn bread, syrup and fat pork, the dietary staples in this section of rural Alabama.

Clinical Findings

The results of the dental examination in which the mouth mirror, exploring tine and bitewing or full mouth roentgenograms were used are summed up in Table 3, where it is noted that the experimental group had an average of 2.07 tooth surfaces decayed, 1.60 teeth missing and 0.96 tooth surfaces filled. In contrast, the control group had an average of 3.21 tooth surfaces decayed, 2.23 teeth missing and 9.75 tooth surfaces restored. The average of the total DMF was 4.54 for the experimental group and 14.94 for the control group. The experimental group thus had 30.5 per cent as much caries per individual as did the control group. The number of missing teeth refers only to those teeth which are known to have been extracted because of caries or complications resulting from caries. The experimental group had 130 teeth extracted because of pyorrhea or malocclusion; the control group had 117 teeth extracted for the same reasons. Forty-three of the 124 malnourished patients exhibited clinical signs and symptoms of periodontoclasia (pyorrhea). Pyorrhea was very prevalent in the persons in this group above the age of 35. By comparison, only 6 of the 99 well-nourished patients could be classified as having pyorrhea when the same criteria were applied.

Dental Caries Summary

The results of the chemical and bacteriologic tests for dental caries activity are summed up in Figures 1 and 2. In Figure 1 it is observed that of the 124

tests in the malnourished group, 44 were negative, 55 were plus or minus, and 25 were positive on the basis of the Fosdick, Hansen, Epple test for dental caries activity. The results are especially striking when it is noted that 19 of the 25 positives were 1 plus and 2 plus, with none of the readings exceeding 2 plus. By comparison, the well-nourished group showed a caries activity distribution which is to be expected in the general population.[28] Twelve of the 99 were negative and 16 were 4 plus, with the remainder scattered through the intermediate readings.

In Figure 2, a comparison is drawn between the results of the bacteriologic test for dental caries activity for the control and experimental groups. Twenty-seven of the experimental group had a zero count while 76 had counts ranging between 1 and 5,000 L. acidophilus per cubic centimeter of saliva. Only 21 patients in this group had counts above 10,000 L. acidophilus per cubic centimeter of saliva. There were no counts which exceeded 20,000. The control group showed a much wider range. There were 3 with a zero count, and 4 above 100,000 bacteria per cubic centimeter of saliva. The 92 remaining patients were again distributed among the intermediate readings.

Figure 3 summarizes the results of the buffer capacity test. This test was performed on 16 of the experimental patients and 91 of the control patients. The average buffer capacity of the malnourished patients, as measured in terms of cubic centimeters of 0.1 N lactic acid required to lower the pH of a 5 cc. saliva sample from pH 7.0 to pH 6.0, was 0.616 cc. 0.1 N lactic acid. The value obtained for the adequately nourished group was 0.404 cc. 0.1 N lactic acid. These figures were of greater import when it was seen that 12 of the 16 malnourished patients showed negative or plus or minus values by the bacteriologic and chemical tests and had an average buffer capacity of 0.692 cc. 0.1 N lactic acid. In a similar manner, the 13 patients with negative readings in the control group of 91 tested for salivary buffers had an average buffer capacity of 0.480 cc. 0.1 N lactic acid as opposed to the average value of 0.392 cc. for the 78 patients with positive readings on the two other tests.

28. Arnold, F. A., A Study of the Relationship of Oral Lactobacillus Acidophilus and Saliva Chemistry to Dental Caries. *Pub. Health Rep.* 56:1495 (July) 1941.

Fig. 1.—The decreased caries activity of the malnourished group is demonstrated by the comparison of the results of the Fosdick, Hansen and Epple test for dental caries activity. Only 25 of the group of 124 malnourished patients were positive by this test. None of the readings exceeded 2 plus. The well-nourished control group showed a distribution of caries activity expected in a study of the general population

Fig. 2.—The decreased caries activity of the malnourished group is demonstrated by the comparison of the results of the Hadley bacteriologic test for dental caries activity. There were no counts in the experimental group which exceeded 20,000 Lactobacillus acidophilus per cubic centimenter of saliva. Only 21 patients in this group had counts above 10,000 L. acidophilus per cubic centimeter. The control group of well-nourished patients shows the wide range of distribution characteristic of the general population

Table 4.—Comparison of chemical test for caries activity with clinical signs and symptoms of nutritional deficiency diseases in 124 malnourished patients

Fosdick's Classification of Caries Activity	Pellagra	Riboflavin Deficiency	Thiamin Deficiency	INS	Vitamin A Deficiency	Vitamin C Deficiency	Anemia
−	10	28	10	15	4	9	8
±	13	40	12	8	4	7	5
+	7	12	1	1	3	1	1
++	4	4	4	5	0	0	1
+++	0	0	0	0	0	0	0
++++	0	0	0	0	0	0	0
Total	34	84	27	29	11	17	15

Tables 4 and 5 present the findings of the chemical and bacteriologic tests when compared with the various deficiency states. The heavy preponderance of negatives and plus or minuses obtained with the chemical test and the unusually low Lactobacillus counts again serve to emphasize the decreased caries incidence among the malnourished patients in our experimental group.

Discussion

A review of the literature on the relationship of diet to dental caries revealed that a more accurate study of the dietary habits and clinical and laboratory findings was necessary before a comparison of the dental caries activity in malnourished and adequately nourished patients could be made.

In this study a medical examination, blood vitamin level determinations and dietary evaluations established the nutritional status of the two groups of patients studied. A high correlation in the findings pertaining to the nutritional status of the patients was obtained when the results of these three methods were compared. Clinical lesions of nutritional deficiency disease, low blood vitamin levels and dietary histories indicating widespread deficiency in the intake or absorption of the various nutrients constituted the picture of the nutritional status of the patients in the experimental group in more than 90 per cent of the cases. By comparison, the control group showed a complete freedom from clinical evidence of nutritional deficiency and nearly always normal or above normal vitamin levels in the blood.

A noteworthy correlation existed between the nutritional status and the dental caries activity. This correlation was borne out by the clinical findings as well as by the chemical, bacteriologic and buffer capacity tests for dental caries. While the control group showed the normal distribution of activity which is to be expected in a study of the general population,[28] the experimental group exhibited a dental caries activity which, on the basis of the clinical findings and laboratory tests, was far below the average.

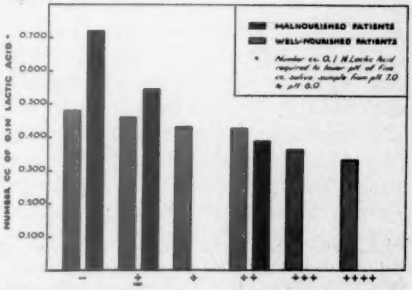


Fig. 3.—A comparison of the results of the buffer capacity test for dental caries (Dreizen, Mann, Cline and Spies) shows that malnourished patients do have a higher buffer capacity than the well-nourished control group. This graph also illustrates, in general, the inverse correlation between the buffer capacity of the saliva and the dental caries activity

Table 5.—Comparison of bacteriologic test for caries activity with clinical signs and symptoms of nutritional deficiency diseases in 124 malnourished patients

Bacterial Count	Pellagra	Riboflavin Deficiency	Thiamin Deficiency	INS	Vitamin A Deficiency	Vitamin C Deficiency	Anemia
0	8	17	5	7	0	6	2
1- 5,000	22	53	16	18	9	8	9
6,000-10,000	2	12	3	2	1	3	4
11,000-20,000	2	2	3	2	1	0	0
Above 20,000	0	0	0	0	0	0	0
Total	34	84	27	29	11	17	15

Summary and Conclusions

1. The incidence of dental caries in 223 patients was studied.

2. A medical examination, blood vitamin level determination, dental examination and chemical and bacteriologic laboratory tests for dental caries activity were performed on each patient. A buffer capacity test for caries activity was performed for 16 patients in the experimental group and 91 patients in the control group.

3. One hundred twenty-four patients showed evidence of nutritional deficiency disease on the basis of the medical, hematologic and dietary studies while 99 patients were free from evidence of these diseases.

4. The 124 malnourished patients had an average of 2.07 tooth surfaces decayed, 1.60 teeth missing, and 0.96 tooth surfaces filled. In contrast, the control group had an average of 3.21 tooth surfaces decayed, 2.23 teeth missing, and 9.75 tooth surfaces restored. The malnourished patients thus showed an incidence of dental caries only 30.5 per cent as great as that of the patients in the well-nourished group.

5. The observations made by Corkhill, Roberts, Sandwith and Mann, that a lowered incidence of dental caries is present in persons affected with pellagra and also in persons with associated deficiencies, are thus supported.—*Hillman Hospital.*

National Insurance.—The Ministry of Social Affairs of Iceland has issued a report detailing a national insurance plan on which an all-party committee is reported to be preparing a bill. The new plan draws upon Iceland's already long experience of social insurance, but is much influenced by the plans of New Zealand and Great Britain. All citizens between the ages of 16 and 66 years are compulsorily insured against sickness, maternity, invalidity, old age, death and family charges. Employers, with minor exceptions, are required to insure their work-people against employment injury. The health services provided under the national insurance plan comprise, on the one hand, preventive care given in institutions maintained in cooperation with the Health Department, and, on the other hand, the refund of expenses for hospital treatment, physicians' fees and medicine.—*From "A National Insurance Plan for Iceland," Internat. Labour Rev. 50:258-262 (March-April) 1946.*

DIAGNOSIS AND TREATMENT OF DISTURBANCES OF THE TEMPOROMANDIBULAR JOINT ESPECIALLY IN RELATION TO VERTICAL DIMENSION

Louis S. Block, D.D.S., Louisville, Ky.

The diagnosis and treatment of problems of the temporomandibular joint in relation to vertical dimension should be of especial interest to our profession today in view of the many patients we are seeing who are making their first visit to the dentist for complete restoration of their mouths and are desirous of more service than emergency relief from pain. If we intend to assume our professional obligations to these patients we must understand and recognize all abnormalities of the mouth and jaws. Whether or not the dentist wishes to undertake the treatment of temporomandibular joint disturbances, he should acquaint himself with the subject well enough to see at least that the patients are referred for proper treatment. Every dentist may not choose to reduce a jaw fracture, remove an impacted lower third molar, treat osteomyelitis, practice orthodontia, treat advanced periodontitis or lesions of the mucous membrane, but he is trained to recognize these conditions and advise his patient where to obtain treatment. Therefore, a more universal knowledge of the subject of disturbances of the temporomandibular joint is important.

Even though some members of our profession still consider the subject to be controversial, their theories cannot stand up against the relief of thousands of patients, partially or completely relieved by proper dental diagnosis and treatment. The choice of a treatment method may and, I believe, should, be subject to controversy, but not the value of the fundamental principles involved. It is true that many mistakes have been made and certainly more will follow but let us always remember Theodore Roosevelt's words, "The only man who never made a mistake is the man who never did anything."

Need for Further Study

When we realize that well-established institutions such as the Mayo Clinic are open-minded and sufficiently interested in the subject to recognize these temporomandibular joint cases, it would appear to be time for our entire profession to approach the question with vision and a desire for enlightenment. In so doing, more knowledge for the welfare of our patients will be unfolded. I believe that diagnosis and treatment of temporomandibular joint problems should be part of the dental college curriculum so that graduates are at least acquainted with the subject.

Most patients suffering from disturbances of the temporomandibular joint go first to the otolaryngologist with their complaint. Unless the patient is fortunate enough to select an otolaryngologist who recognizes the relationship of the patient's symptoms to occlusal abnormalities, the patient may never obtain relief. My experience has been that many patients have drifted from doctor to doctor, including those of our own profession, with never a suggestion that their symptoms might arise from a mouth or jaw condition. Harris[1] has said: "There is no

1. Block, L. S. and Harris, Elam, An Approach to a Rational Study and Treatment of Temporomandibular Joint Problems. *J.A.D.A.* 29:349 (March) 1942.

desire to encroach upon the field of the physician. Dentists have not entered this field from choice. Since the dentist is the only one who can correct the [dental] abnormalities . . . he alone can relieve whatever disturbances may arise from the abnormalities [and] therefore he has no choice. He must recognize and assume this responsibility and cooperate fully with the medical men." To apply a popular expression, we must become temporomandibular joint "minded" and once having become so, we must present the subject to the medical profession and the public in order that they may become like-minded.

Methods of Diagnosis

Dentists sometimes tell me that they never see any of these temporomandibular joint cases. My answer is that we should consider the possibility of the presence of abnormal jaw relationship and incorrect vertical dimension in every patient we see. Just as full mouth roentgenograms and careful clinical examination of the teeth have become routine procedure in the modern and properly operated dental office, so should a thorough clinical examination be made and a history be taken for signs and symptoms of temporomandibular joint dysfunction. The side of the face over and behind the temporomandibular joint on both sides should be palpated, using a great deal of pressure, both while the teeth are clenched and while the patient is opening and closing the jaws. The patient should feel no pain from this palpation. Nor should the patient feel pain if the doctor's little fingers are placed in the external auditory canals, using a downward and forward pressure while the patient opens and closes the jaws. If pain is present we cannot assume that dental treatment is necessary, because a pathologic condition may be present from other causes; but the fact is noted and considered with other factors in making our diagnosis. Careful clinical study of the occlusion and of well-made and properly mounted study models frequently discloses abnormal wear of the teeth, either bilateral or unilateral. Carefully testing the patient's centric relationship often brings to light a premature contact on one or two points, which causes the mandible to stop and then slide into eccentric position. If this is suspected we must remember that trismus is usually present in the muscles of mastication if the patient has been biting improperly for any length of time. This being so, the patient must be relaxed before true centric relationship can be determined. When trismus is suspected and there is difficulty in determining jaw relationship and vertical dimension, my office procedure is to prescribe a soft diet, hot packs to the jaws and side of the face and mild sedation for the patient for 24 to 48 hours, after which I see the patient again. At this time the muscles are usually relaxed and more accurate findings can be made. Brief questioning of the patient regarding chewing habits, position of the head and face while sleeping or during employment can be made and may bring out leading points.

The Costen Syndrome

The history should include questioning of the patient for the symptoms first outlined by Costen in 1934, which are now known as the Costen syndrome. This list as originally presented remains essentially unaltered after nine years, so thoroughly did Costen go into the histories and symptomatology of his patients. The list, frequently presented to our profession, merits repetition here and many times in the future until it is known, understood and recognized by all. Until recently, otolaryngologists seldom concerned themselves with the temporomandibular articulation other than in cases of anterior dislocations, fracture of the neck of the condyle and ankylosis of the joint after chronic irritation or infection. These conditions have received a great deal of com-

ment and appropriate treatment has been worked out. Costen[2] has said:

The following group of symptoms may be observed frequently in patients with edentulous mouths and those with a marked overbite; the syndrome is classic for lesions of the sinuses or ears; yet overbite and disturbances of the joint are so easily overlooked as etiological factors that it becomes a source of error in analyzing cases in otolaryngology. Each of these symptoms may be ascribed to some evident disturbance in anatomic function of the joint, its ligaments and muscular attachments. The ear symptoms depend upon actual involvement of the eustachian tube and tympanic structures. The sinus symptoms are more apparent than real. The actual source of this group of complaints was confirmed by the marked improvement which followed correction of the overbite, renewal of molar support to take pressure off the condyle, and establishment of proper articulation of the condyle within the fossa.

The ear symptoms are: Impaired hearing continuously or with intervals of improvement. Stopping of or "stuffy" sensation in ears. Tinnitus, usually "low buzz" in type, less often a snapping while chewing. Pain, dull type, within and about ears. Dizziness, mild; again, attacks of prostrating severity, definitely relieved by inflation of the eustachian tubes.

The alleged "sinus" symptoms were: Headache, severe and constant; localized to vertex and occiput, and behind the ears—typical site of posterior sinus pain—but increasing toward the end of the day (atypical sinus history), and suggestive of eye headache. Burning sensation in throat, tongue and side of nose.

The diagnosis of this condition is established by: (1) The lack of molar teeth (abnormal wear of teeth), or badly fitting dental plates permitting overbite (meaning overclosure), (2) mild catarrhal deafness, improved at once by inflation of eustachian tubes, (3) dizzy spells, relieved by inflation of the tubes, (4) comfort to the patient by interposing a flat object between the jaws, and (5) presence of the typical headache after sinus or eye involvement has been corrected; presence of the typical headache when sinuses or eyes are found to be negative.

2. Costen, J. B., Syndrome of Ear and Sinus Symptoms Dependent Upon Disturbed Function of the Temporomandibular Joint. *Ann. Otol., Rhin. and Laryng.* 43:1 (March) 1934.

The Neurotic Patient

We should bear in mind that many of our patients are neurotics, in varying degrees, and that blunt outspoken questions regarding their symptoms may bring about the surprising response that all these symptoms are present and more, as well. Therefore, leading questions which will draw out the patients' own stories are advisable. For the sake of simplicity we can group the symptoms into three categories: (1) acute local pain around and within the temporomandibular joint, (2) headaches and neuralgia of the side of the head, face or in the mastoid region and (3) eustachian symptoms such as stuffy feeling in the ears, vertigo, tinnitus and simulated catarrhal deafness.

If the patient with temporomandibular joint difficulties is referred to the dentist by a physician, the dentist should be informed of the medical history which bears any relation to the dental treatment. If there is impaired hearing, what type of deafness is present? It is useless to expect any type but obstructive deafness to respond to repositioning of the mandible. The dentist should be told if inflation of the eustachian tube was attempted and whether air passed through the tube easily, with difficulty or at all. He should be acquainted with any history or presence of infection of the sinuses or ears, or damage to the drum, with findings from audiometric and blood pressure tests and knowledge of the patient's general condition. If the dentist sees the patient first and suspects eustachian involvement to be among the patient's ear symptoms he should refer the patient to a competent otolaryngologist in order that the suspicions may be verified or ruled out before any report to the patient is made or any treatment attempted.

Some cases are so definitely the dentist's own problem for both diagnosis and treatment that consultation with a physician is not necessary. These are the cases visibly resulting from (1) loss of vertical

dimension owing to lost and unreplaced posterior teeth, (2) excessive wear of posterior teeth or (3) dentures allowing overclosure.

Use of the Roentgenogram

The use of lateral jaw roentgenography is very helpful in verifying and sometimes in making a diagnosis. Findings in these roentgenograms are sometimes surprising and frequently very useful. We know from many accepted and outstanding authorities, including Gray,[3] the normal position of the condyle head in the glenoid fossa when the teeth are closed in centric occlusion. The consensus is that the articular relationship with the teeth occluded is between the anterosuperior surface of the condyle and the inferoposterior surface of the articular eminence. It is important to note that the condyle is not in contact with the fossa except at the lower part of its anterior wall, which is also the posterior wall of the articular eminence.

We may find many persons, whose roentgenograms show an abnormal posterior or upward displacement, who have no symptoms whatsoever and whose clinical picture shows extreme overbite or loss of vertical dimension. These patients should not have their bites disturbed unless some other good reason indicates the necessity for such treatment. However, if this posterior or upward displacement is demonstrated by roentgenography, and is accompanied by temporomandibular disturbances, the film will be useful for any one or all of the following reasons:

1. It may show that the vertical dimension may be increased with a certain degree of safety, since we are assured that the condyle head will not be brought downward and forward beyond the normal position after correction.

2. In cases in which the symptoms are unilateral, if the displacement also is found to be unilateral, the treatment may be unilateral. Treating such a patient bilaterally may bring the condyle head on the unaffected side too far downward and forward. Harris was the first to call this to our attention.

3. Damage to articulating surfaces is frequently found. This damage, incidentally, is almost invariably unilateral and, when demonstrated by roentgenography, is a great aid in diagnosis.

I am frequently questioned regarding the accuracy of these temporomandibular joint pictures and whether or not they can be retaken to show the same joint position. Following a simple technic carefully ensures pictures sufficiently accurate for study in this work, since exact measurements of spaces and movement within the joint are unnecessary. Pictures retaken any number of times, provided care is exercised, will show but slight variation, insufficient to concern the operator or affect the diagnosis in any way. It is practically impossible to distort the picture enough to be confusing.

Roentgenographic Technic

The only equipment necessary is an x-ray machine, a 5 x 7 inch or 8 x 10 inch cassette, preferably with intensifying screen, and some device, homemade if necessary, to indicate the point on the head through which the central ray is passing. The recommended technic follows:

The side of the patient's face is placed flat against the cassette. The machine is set 20 inches from the cassette (measuring from target of tube to cassette) and is turned 15 degrees to the feet, the central ray entering the head two and one-half inches above and one-half inch behind the external auditory canal. To locate this spot, project an imaginary line directly upward from the external auditory canal, parallel to the profile. Two and one-half inches up on the line, drop the pointer back one-half inch. Following this procedure will result in a picture of the glenoid fossa and condyle on the

3. Gray, Henry, *Anatomy of the Human Body*. Philadelphia: Lea and Febiger, 1918, twentieth edition, p. 895.

opposite side. Reduce the angle to the feet from 15 degrees to 12 or even 10 degrees, in case of an extremely square type of head and increase to as high as 18 degrees for a tapering head. Practice and a certain amount of ingenuity are required to adapt this technic to one's own machine.

A knowledge of anatomy is necessary to an understanding of why loss of vertical dimension and occlusal disharmonies can cause the symptoms under discussion. The physician, knowing little or nothing of dental technic, relies entirely on our judgment and skill in carrying out dental treatment. Therefore, we must refresh our knowledge of the anatomy of the temporomandibular joint in order to be able to visualize the changes that may take place in that area. Only when the individual dentist can give the anatomic explanation of temporomandibular joint symptoms as well as he can construct dentures, bridge work and corrective appliances will he be entitled to the physician's complete respect and support.

Anatomic Explanation of Pain

The symptoms may be classed as either (1) traumatic within the joint, resulting from displacement or injury within the glenoid fossa or (2) those resulting from overcompression of the eustachian tube. The patient may be suffering from either of these groups of symptoms or both. The anatomic explanation of pain in connection with disturbed joint function is:

1. Loss of molar support, malocclusion of the teeth or excessive wear of the teeth which may permit the condyle head to be displaced posteriorly. Thus, during chewing or swallowing movements, the condyle may exert pressure on or near the auriculotemporal nerve which passes close to the mesial side of the capsule and between the condyle and the tympanic plate to distribute over the temporal region. The auriculotemporal nerve branches supply (a) the skin covering the front of the helix and tragus of the ear, (b) the skin lining the external acoustic meatus, (c) the tympanic membrane, (d) the posterior part of the temporomandibular joint, (e) the parotid gland, (f) the vertex of the skull and (g) the skin of the temporal region; and (h) they communicate with the facial and zygomaticotemporal nerves.[3]

2. There is the type of pathologic joint in which the condyle snaps backward over the articular disc, impacting and eroding the tympanic plate. The chorda tympani nerve passes this spot through the iter chordae anterius at the medial end of the petrotympanic fissure. After traversing the glenoid fossa, the chorda tympani nerve descends between the external and internal pterygoid muscles and joins the posterior border of the lingual nerve. The majority of its fibers are sensory and are continued onward through the muscular substance of the tongue to the mucous membrane covering its anterior two-thirds. They constitute the nerve of taste for this portion of the tongue. Before uniting with the lingual nerve, the chorda tympani is joined by a small branch from the otic ganglion.[3]

3. Deep erosion of the bone of the glenoid cavity leaves only a thin plate between the condyles and the dura.[4] Each closure of the jaw impacts this evacuated area with the condyle, which thus rocks in the glenoid fossa, barely separated by the remaining thin bone from the dura and its rich nerve supply. It is therefore quite possible that dull vertex pain from this source may be of dural origin, that pain over the temporal region originates in irritation of the auriculotemporal nerve, and that pain referred to the side of the tongue may be attributed to pressure on the chorda tympani nerve.[2] This should clarify the cause of the pain or neuralgic symptoms. The symptoms resulting from compres-

4. Prentiss, H. J., A Preliminary Report Upon the Temporomandibular Articulation in the Human Type. *D. Cosmos.* 60:505 (June) 1918.

sion of the eustachian tube are explained by Costen[2] as follows:

With the joint in normal position, the external pterygoid muscle is taut and the tensor veli palatini muscle borders the tube anteriorly on an almost straight line. Between these lie only connective and adipose tissue, and posteriorly, close to the tube, are the auriculotemporal and the inferior alveolar nerves. If the jaw is brought upward into a position of marked overclosure, the internal pterygoid muscle is relaxed and a bundle of soft tissue piles against the tube. The tensor veli palatini muscle appears loose, preventing its function of tightening the soft palate and opening the eustachian tubes during swallowing. Especially during the act of swallowing, when the tensor veli palatini muscle usually opens the eustachian tubes, the compressing effect of the tissues on the tube from the overclosure is present and prevents it.

The very looseness of the capsule of the mandibular joint and its restraining ligaments now work to exaggerate further the pushing of tissues toward the tube. With each overacting closure of the mandible by the masseter muscles the condyle is shoved upward against the atrophic meniscus, or it moves backward to the tympanic plate and pushes mesially on one side or the other through the loose capsule. This happens countless times during each meal, when the patient retrudes the jaw to occlude his poorly fitting dentures or overclosed jaws. The overclosure with atrophy of the joint structure occurs at once if the dentures are poorly fitted or if overbite permits it. It develops slowly if the same dentures are worn for many years, if overbite is left uncorrected or if molar support continues unrestored.

Damage to articular surfaces usually can be seen on the roentgenogram. Harris has demonstrated several cases with symptoms of severe pain in which an aseptic necrosis of the condyle head was disclosed by roentgenography. Several months after dental correction of the condition, which prevented the upward and backward shifting of the condyle head on the closing jaws, roentgenograms showed the articular surface of the condyle head to be smooth instead of etched and irregular as shown in the original pictures.

Centric Relationship

We can treat these patients only if we know what end results we are trying to obtain. In all cases we should aspire to restore the patient's centric relationship, balanced occlusion and vertical dimension to as near the normal as possible. We have discussed methods of eliminating trismus by relaxing the musculature in order to aid in determining centric relationship. If the methods suggested are not adequate, temporary silver splints, worn a few days or possibly weeks, sometimes provide enough rest to the irritated structure and tissues within the joint to permit the patient to close in true centric relationship with ease and comfort. Only in cases of extreme distoocclusion, when all other measures have failed, do we ever consider violating our rule by increasing the vertical dimension. In a few of these extreme cases we have arbitrarily brought the mandible forward. Carving the teeth with new inclined planes into the splints has given satisfactory results as far as disappearance of the patient's symptoms are concerned. In all of these cases, when the temporary guiding splints are removed, the patient can again retrude the mandible to its original position. In cases in which natural teeth are present, as well as in edentulous cases, intermaxillary tracings may be used. Any technic is satisfactory so long as the results are correct.

Balanced Occlusion

Balanced occlusion is an essential factor in the proper restoration of any dentition. In corrective work, when height is added to the teeth, it is especially important. The additional strain upon the teeth and their supporting structures makes it imperative to eliminate occlusal interference and to strive for bilateral

balance in centric relationship and in lateral and protrusive excursions.

Vertical Dimension

Vertical dimension is equally important. As may be the case in securing centric relationship, when trismus is present within the temporomandibular joint, a true rest position will be difficult to determine. A temporary buildup may be necessary until all inflammatory conditions within and around the joint subside. In all other cases, the fundamental rules of denture construction must be adhered to: consideration of a rest position, adequate intermaxillary space and esthetics. There are many methods of determining vertical dimension and it is difficult for one to make definite statements with an assurance of being correct. Swenson[5] has said, "The only definite statement that should be made is that it is an indefinite procedure." I believe that I have tried all of the existing methods and I have concluded that regardless of what methods we use, our results will be substantially the same. The various means I have employed include: use of the Boos Bimeter, study of the intermaxillary space between physical and physiologic rest positions, following the theory that patients retain their muscle sense as to proper degree of closure, profile study or attempting, in edentulous cases, to parallel the ridges. I have had edentulous patients close into softened wax to "where their natural teeth used to be," allowing their muscle sense to guide the amount of opening. The Bimeter was then used on these patients, after which the opening component was determined by permitting the patients to relax and by limiting the free space between the upper and lower arches to approximately 2 mm. in the first bicuspid region. We found practically no variation in the vertical dimension achieved by the different methods. In all of these cases the ridges were parallel so far as the eye could see.

Trial Appliances

I am unalterably opposed to treating temporomandibular joint disturbances by an operation for complete reconstruction of the mouth until temporary appliances have been tried. Temporary correction is always indicated. This may consist of stilts or splints or combinations of partial dentures and splints, including onlays rather than rests to fit over the teeth. When the new and corrected vertical dimension is determined, the case mounted in centric relation and the condylar indications set, we must decide on the type of temporary appliance to be constructed. The simplest and least expensive choice, practical in most cases, is the silver splint. When this is not advisable, removable appliances on one or both arches must be used. At this time it is well to mention the depression of posterior teeth which sometimes occurs under splints. In a small percentage of cases the osseous structures will not tolerate the continuous wearing of splints. Careful and frequent observation of all patients is necessary. When such depression is noted, the cemented splints are removed and the teeth are permitted a few days to return to their normal position after which removable appliances are substituted. These appliances may be removed at night or for several hours during the day, thus controlling depression.

After the splints have been worn a short time and the occlusion is adjusted and balanced, it is possible that slight changes in the jaw relations may still occur. This indicates that the muscles are now more relaxed than they were at the time of insertion of the splints, and substantiates our warning against the performance of permanent work too early. Another valid argument against doing permanent work before inserting trial appliances is that sometimes the

5. Swenson, M. G., *Complete Dentures.* St. Louis: C. V. Mosby Company, 1940, p. 311.

treatment fails to relieve the symptoms. It would be a great injustice to both patient and operator if inlays and bridgework, requiring extensive time and expense, were to bring the patient no relief. The harm to our profession of such a case would more than offset the credit of a dozen successful ones. If temporary appliances fail to relieve the symptoms, they can be removed, after fair trial, and the patient is no worse off than before treatment was started. Naturally, the more experienced the operator becomes in this field, as in any other, the more successful will be his diagnosis and treatment.

Some patients experience relief within a few days; others note no change for two or three months. With our present knowledge we have no guide as to the length of time required for improvement. Some patients suffer pain and discomfort for a few days before improvement is noted. Others require several adjustments but improve gradually from the start. When delivering splints to a patient I explain these possibilities in the interests of cooperation.

Permanent Restoration

When we are convinced that our treatment has relieved the patient, it is time for permanent work. If final proof is necessary the splints may be removed and the patient permitted to go without the corrective appliance for a few weeks. At the first sign of returning symptoms, the patient will be anxious to have the permanent work completed.

There is no definite technic for changing over to permanent work. The new jaw position achieved by the splints should be maintained. If fixed restoration is decided on, the work can be done on one side of the mouth with the splints in place on the other side. Usually the splints are on either the upper or lower arch only. The permanent crowns, onlays and bridges should be placed so that the restored mouth will function in centric and in all eccentric positions. Sometimes a case calls for work on both upper and lower arches in selected places. Since each case will present its original problems, no formula will be found helpful. These problems do not arise when the patient is edentulous. I do not believe in temporary treatment dentures. After treating many such cases I am convinced that the sooner the patient achieves maximum opening within physiologic limits the better. Naturally, we have to consider the condition, size and shape of the alveolar ridges as well as the age and physical condition of the patient before giving this maximum opening. But I have had no more success increasing vertical dimension in stages with several sets of dentures than with a single set.

Summary

1. It is time that dentistry as a whole accepted and studied the subject of disturbances of the temporomandibular joint as thoroughly as it studies operative dentistry, oral surgery or any other branch of our professional work.

2. We should not attempt to treat many of the patients without the cooperation of a physician, preferably an otolaryngologist.

3. It is our duty to acquaint the medical profession with the work after learning it ourselves.

4. The anatomic explanations are sound and have been repeatedly proved.

5. The lateral jaw roentgenogram is a valuable asset in diagnosis and treatment and can be made in the dental office by any dentist who owns or has access to an x-ray machine.

6. The patient must be relaxed before true clinical findings can be made.

7. Temporary work should always be done for preliminary trial.

8. This work requires study, patience, understanding and sympathy for the patient.—*The Starks Building.*

THE CLINICAL PROBLEMS OF THE TEMPOROMANDIBULAR ARTICULATION

Roger G. Gerry,* D.M.D., Philadelphia

THE VARIOUS forms of pathologic problems of the temporomandibular articulation and their treatment have been discussed at length in numerous articles. In spite of this wealth of material, there are many temporomandibular complaints which never have been satisfactorily diagnosed or treated. The purpose of this paper is to attempt to classify these conditions and to describe a few of the fundamental principles of their diagnosis and treatment.

A certain amount of neglect in the treatment of patients who have temporomandibular complaints has resulted from the fact that professionally they may be regarded as belonging in the fields of orthopedic surgery, otolaryngology and dental surgery, and practitioners in each group may feel that treatment is the responsibility of one of the other specialties. This explanation does not eliminate the fact that many objectionable conditions, causing permanent discomfort, could have been remedied if they had been diagnosed and treated sufficiently early.

Examination of the joint is somewhat difficult because it, or parts of it, are deep in heavy muscular and bony structures. Roentgenographic examination is also not entirely satisfactory because of superimposition of shadows of other parts. Laminagraphy seems to be of more value than standard roentgenography, although some authorities[1] do not think that a true picture of the joint tissues is obtained. Roentgenograms, no matter how excellent, also have diagnostic limitations in that some pathologic processes of the temporomandibular articulation are limited to the softer structures and are not evident on roentgenographic examination. Junemann[2] reported, after examining a large number of roentgenograms of temporomandibular joints in which clinical evidence of disease had been noted, that these roentgenograms showed no visible evidence of irregularities, destruction of bone or other abnormalities of any of the bony structures. Also, in certain cases in which actual bony deviations from normal exist, as in a painful chronic dislocation, the patient while in a conscious state will not open his mouth wide enough so that the abnormality can be demonstrated roentgenographically.

The temporomandibular articulation is a true or diarthrodial joint, compound because of the presence of a fibrocartilaginous meniscus between the two opposing bony surfaces. In addition, it is ginglymo-arthrodial because it combines hinge action and gliding characteristics.

Classification

It seems evident from observation of patients who have temporomandibular pain that the various complaints can be

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the United States Navy. The opinions and views set forth are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

*Commander, United States Navy, U. S. Naval Hospital, Philadelphia.

1. Shapiro, H. H., and Truex, R. C., The Temporomandibular Joint and the Auditory Function. *J.A.D.A.* 30:1147 (August) 1943.

2. Junemann, H. R., Consequences of Shortening the Intermaxillary Distance. *J.A.D.A.* 28:1427 (September) 1941.

classified, according to their origin, into three groups, namely, (1) systemic, (2) oral and (3) external.

Group 1, Systemic.—This group consists of those cases in which trauma is not a causative factor, such as the temporomandibular manifestation of generalized arthritis, in which the temporomandibular condition is treated as part of the generalized pathologic process. The group also includes cases of extension of other infections to include the temporomandibular joint, such as mastoiditis or osteomyelitis of the temporal bone. In these conditions, treatment of the temporomandibular problem is incidental, or secondary, to treatment of the original condition.

Group 2, Oral.—This group consists mostly of those cases in which the causative factor is usually, for lack of a better term, intrinsic trauma.

The source of trauma ordinarily is malocclusion or absence of the teeth. It is a well known fact that the anatomy of the temporomandibular joint is altered in conformity with changes in the anatomy of the teeth. As the chewing surfaces of the teeth are altered, or worn, the condylar surface of the joint and the articular eminence are flattened with a resultant loss in the vertical dimension of the joint. At the same time the position of the condyle at rest tends to move posteriorly in the glenoid fossa. With loss of the posterior teeth, or all the teeth, this condition becomes more pronounced and the joint loses in its vertical dimension and the motility of the mandible is increased. Irregular movements of the mandible, caused by malocclusion, also cause reflected changes in the joint. In the so-called locked bite in which lateral excursion of the mandible is inhibited because of malocclusion, the condyloid process decreases in its anteroposterior dimension and the glenoid fossa increases in depth, thus increasing the vertical dimension of the joint. These factors are mentioned in an effort to emphasize the necessity of careful consideration of dental occlusion in the diagnosis of temporomandibular conditions, especially in cases in which external trauma is not a factor.

Temporomandibular pain can occur only by stimulation of one of two nerve pathways, the chorda tympani of the facial nerve and the auriculotemporal nerve. In malocclusion, especially with loss in the vertical dimension, there is always the possibility of positive pressure on the nerve endings from the pressure of the mandibular condyle conducted by the softer tissues of the joint and its surroundings.

Costen[3] and others have said that decrease in the vertical dimension caused a closed bite, with accompanying edema and loss of patency of the eustachian tubes. The most common symptom is headache, but tinnitus, loss in auditory function and, less frequently, glossodynia (burning tongue) and burning pharynx also may be present. These authors attributed the latter two sensations to reflex stimulation of the auriculotemporal nerve, producing pain in the lingual branch of the mandibular nerve, and the emergence of the chorda tympani at the mesial edge of the mandibular fossa.

Many patients with the syndrome described by Costen attempted to gain relief by having the bite raised by means of onlays on the teeth. A large number of these patients experienced no lasting relief from either the headaches or decreased auditory function. Costen explained this lack of response by the fact that mere opening of the bite by building up all the teeth would not correct the impaction of the mandibular condyles against the thin bone separating them from the dura. He recommended that in opening the bite it was necessary to correct only in the area of the molar teeth, using 2 to 4 mm. cork blocks, so that the vertical dimension actually

3. Costen, J. B., Neuralgias and Ear Symptoms Associated with Disturbed Function of the Temporomandibular Joint. *J.A.M.A.* 107:252 (July 25) 1936.

would be increased and the condyles pulled down from the glenoid fossa.

Many authorities, however, disagreed with these opinions. Batson[4] said that deafness caused by pressure by the temporomandibular joint on the eustachian tubes was uncommon and that he never had seen a clear-cut case of improvement. Junemann[2] found on examination of patients treated by increasing the vertical dimension that the statistics of improvement in hearing were not confirmed by prolonged audiometric examination. Shapiro and Truex,[1] in a comprehensive paper, said that repositioning of the jaw would not relieve deafness. They thought that although it "may relieve stuffiness in the ears, joint pains, dizziness and other complaints, these should be differentiated from actual impairment or loss of hearing." Hill[5] analyzed Costen's success by saying, "There is a sort of self-hypnotism among deafened people, who, above all, desire to hear better, which causes them to feel improved, temporarily, under any new form of treatment. This imagined improvement plus the natural enthusiasm of the discoverer of the treatment, sometimes leads to unwarranted claims for its efficacy, and it may have rather widespread use until the careful observations of impartial investigators prove its ineffectiveness."

While malocclusion of the teeth and loss in vertical dimension may or may not cause changes in the temporomandibular joint that result in loss of auditory function, there is no question that actual changes in the joint do take place. These changes may or may not produce local symptoms. The condition produced was described by Dingman[6] as hypertrophic arthritis accompanied by "cracking and snapping sensations, grating noises, and mild aches and pains on mastication." Dingman also remarked that hypertrophic arthritis almost never proceeds to ankylosis.

In the treatment of chronic traumatic, or hypertrophic, arthritis, the most important single feature, to prevent further damage to the temporomandibular joint, is to restore the occlusion to normal. Persistent pain can be relieved by the injection of anesthetic oils into the joint capsule. The actual snapping and cracking sometimes never can be eliminated especially if they occur in an intermediate position in the travel of the condyles. Terminal snapping should be considered as caused by chronic dislocation, or subluxation, and should be treated as such, after any occlusal difficulties have been corrected.

In this group of temporomandibular problems, it is also necessary to consider those patients who have no temporomandibular damage or change, but who have the associated symptoms, especially when these symptoms are of intra-oral origin. Sometimes patients describe temporomandibular snapping which is the result of an elongated superior third molar, which is in traumatic occlusion during lateral excursion of the mandible and which, when the lower teeth pass over it, produces a sensation of snapping.

Impacted superior and inferior third molars, by stimulation of the chorda tympani, occasionally cause pain in the temporomandibular articulation, which disappears on removal of the tooth.[7] Several patients who complained of temporomandibular pain, which was eliminated after the removal of the impacted inferior or superior wisdom teeth, have been observed. Important diagnostic points to consider are that pain is the only subjective symptom, that the impaction must be on the same side as the joint complained of, and that digital and roentgenographic examinations of the articulation will be negative.

4. Batson, O. V., The Closed Bite and Related Clinical Problems. *J.A.D.A.* 25:1191 (August) 1938.

5. Hill, F. T., The Changing Conception of the Management of Chronic Progressive Deafness. *Ann. Otol., Rhin., & Laryng.* 51:653 (September) 1942.

6. Dingman, R. O., Diagnosis and Treatment of Lesions of the Temporomandibular Joint. *Am. J. Orthodont. & Oral Surg.* 26:374 (April) 1940.

7. Shapiro, H. H., Personal communication to the author.

Group 3, Extrinsic. — In cases of temporomandibular conditions of extrinsic origin, the most common force is external trauma, and the most common effect, dislocation. Dislocation, as a result of yawning, also must be considered.

Dislocation of the temporomandibular joint usually causes pain and some swelling of the periarticular tissues and acute serous or serosanguinous effusion within the joint after reduction. Often there is almost complete trismus. Patients with temporomandibular dislocation should have the mandible stabilized, preferably by intermaxillary wiring, as soon as possible after reduction, and it should remain so fixed until all symptoms actually have subsided. In general, the patient who receives this type of treatment will have no permanent articular damage. Severe trauma to the joint, such as a blow to the jaw, may cause similar damage and should be treated in the same manner.

Reports of Cases

The following case is an example of this condition:

The patient complained of pain in the right side of the face, inability to open the mouth, and tenderness on palpation of the right temporomandibular joint. He had received a blow to the face earlier in the day. Since the roentgenograms were negative for fracture, the condition was diagnosed as sprain of the temporomandibular joint, and the mandible was stabilized with intermaxillary wires. The patient was asymptomatic nine days later and the fixation was removed. Twelve days after admission, the patient was able to take a regular diet with no discomfort, and was discharged to duty. During one month of observation after discharge no symptoms of any residual temporomandibular damage were noted.

If temporomandibular dislocation is untreated after the original reduction, chronic dislocation, or subluxation, of the joint is likely to develop. Patients so affected usually learn to reduce the dislocation themselves, and to avoid recurrence by trying not to yawn and by avoiding tough foods. In spite of these precautions, the condition is usually painful and uncomfortable, and should be treated. Sometimes placing the articulation at rest by fixation of the mandible will permit sufficient shortening of the fibers of the capsular ligament and supporting muscles so that an apparently normally functioning joint will result.

A woman, aged 45 years, had dislocated her jaw by yawning, about two months earlier. She complained of chronic recurrent dislocation of the right jaw which occurred with increasing frequency. The jaw was uncomfortable between dislocations, and the condition was embarrassing socially since dislocation frequently occurred while she was dining. Examination of dental occlusion excluded the possibility of articular damage from this source.

The mandibular teeth were fixed to the maxillary teeth with intermaxillary wiring and the patient was observed for two weeks. By the end of this period all discomfort had disappeared. The patient said that since the restraining wires were inserted she had felt and slept well for the first time since her accident, and asked that fixation be retained for another two weeks. Her request was complied with, and at the end of this period the wires were removed. The patient was asymptomatic two days after removal of the restraining apparatus, and during a month of observation no recurrence of symptoms or dislocation was noted.

The importance of absolute rest of the acutely painful mandible cannot be overemphasized. Often it is almost impossible to diagnose acute synovitis, because of limited movement. In conditions of either intrinsic or extrinsic origin, in which an acute inflammatory process is taking place, sometimes each movement of the mandible seems to produce additional trauma and pain within the joint. In these cases the mandible should be fixed with intermaxillary wiring until the acute symptoms have subsided or maximum improvement has been attained. The accompanying use of short wave diathermy, external heat or both often hastens relief. It often has been

said that patients object to the use of intermaxillary wiring for two or more weeks. Experience does not bear this out. Some patients are in such distress that they welcome any recommended treatment. One patient who was in tears from pain had almost complete cessation of symptoms in twenty-four hours.

Many patients, however, who suffer from chronic recurrent dislocation or subluxation will not respond to rest alone. Patients repeatedly have had their jaws wired together for periods of three months and longer in unsuccessful attempts to gain relief. In these cases there is a moderate amount of permanent damage to the joint capsule, ligaments and muscular structures.

Many investigators have attempted to give relief to patients with these complaints, even going so far as to recommend removal of the meniscus as the best treatment. Dorrance[8] reported satisfactory results from traumatizing the articular surfaces with a needle to produce scar tissue.

Schultz[9] has accomplished perhaps more than any other investigator in the treatment of chronic, recurrent, temporomandibular dislocation by the injection of sclerosing agents into the joint capsule. On postmortem examination of dogs that had received eight to ten biweekly injections of 0.5 cc. of a 5 per cent solution of sodium psylliate, the joint capsule was found to be thick and firm and the cartilaginous surfaces and synovial membranes showed no evidence of destructive processes. Two to three weeks after subcutaneous injections of from 5 to 20 cc. there were large regions of firm fibrosis with no evidence of discomfort or sloughing. Injection into the heart and blood stream and into nerve tissue of human beings caused no demonstrable symptoms. Schultz concluded that there was no alteration of the joint cavity since the fibrosis occurred in the ligaments, and there were no gross changes in the ligaments other than thickening.

Schultz[10] reported that the patient is instructed to open his mouth as wide as possible, during which time the condyle is palpated and the solution is injected from behind into the joint capsule. The needle can be recognized as being within the capsule when resistance to its passage suddenly ceases. Thirty minutes after injection, subacute reaction accompanied by leukocytosis occurs. Lymphatic infiltration begins in from two to three hours and fibrosis in from four to six days.

Schultz described the successful treatment of 30 patients in 1937, and has treated many others since. His results have been corroborated by Salman[11] and others.

There is some question as to whether or not the needle is really inserted into the articular cavity. Actually, it would probably be more desirable to inject into the capsule itself, since it is in this part that fibrogenesis is desired.

It seems logical that injection into the small joint cavity, which is almost entirely filled with the fibrocartilaginous meniscus, is neither possible nor desirable. The fact that an agent which would induce fibrogenesis in the capsular ligament would not cause damage to the far more delicate synovial membranes seems almost incredible.[12] It is entirely possible that even if the joint cavity is approached in injection and the capsule is perforated, the synovial membrane is deflected by the needle tip and the agent is deposited between the membrane and the capsule.[13] Since the value of sodium

8. Dorrance, cited by Blair, V. P., and Ivy, R. H., *Essentials of Oral Surgery*. St. Louis: C. V. Mosby Co., 1936, p. 199.

9. Schultz, L. W., A Curative Treatment for Subluxation of the Temporomandibular Joint or of Any Joint. *J.A.D.A.* 24:1947 (December) 1937.

10. Schultz, L. W., Treatment by Injection for Subluxation of the Temporomandibular Joint. *D. Digest* 43:423, 1937.

11. Salman, I., Sclerosing Agent in Treatment of Subluxation of Mandible and of Hemangiomas of Mouth. *U.S. Nav. M. Bull.* 44:361 (February) 1945.

12. Harbert, F., Personal communication to the author.

13. Fisher, H. R., Personal communication to the author.

psylliate in the treatment of chronic temporomandibular subluxation has been proved clinically, this point is raised not to discredit its use but merely to mention that the injection is probably a periarticular one, and that the joint cavity itself is to be avoided.

This technic has been used in the treatment of several patients at the U. S. Naval Hospital, Philadelphia. The following is a description of the most dramatic case:

The patient was a well developed man, aged 23 years. Eight months prior to admission he was struck on the left side of the face while playing football and was unconscious for several minutes. Pain with recurrent dislocation was present in the left temporomandibular articulation, and two weeks before admission to the hospital the discomfort became more severe. Apparently no treatment had been given.

Examination showed typical signs of chronic subluxation, with prominence of the left condyle in the anterior position and accompanying excursion of the mandible to the right. The patient had an artificial upper denture, but there was satisfactory occlusion and no loss of vertical dimension in spite of the absence of some of the lower posterior teeth. Roentgenographic examination of both temporomandibular joints was normal.

Since the mandible could not be fixed with intermaxillary wiring because of the absence of the upper teeth, a leather chin strap was fabricated which maintained the patient's bite in a closed position. He wore this appliance for one month and was simultaneously treated with short wave diathermy. No further dislocation occurred during this period, but there was pain in the left joint.

Three days after the appliance was removed, the patient dislocated his jaw and the chin strap was replaced and retained in position for a second month. After the chin strap was removed the second time, the patient still had chronic dislocation but could avoid it if he was careful.

One week after the second period of fixation, 0.5 cc. of 5 per cent sodium psylliate solution was injected into the left temporomandibular articulation. On the following day the patient not only could not produce dislocation but could open his mouth only about two-thirds the normal opening. Slight pain in the region was relieved by the application of heat. Four days after injection, the patient had a normal opening and was asymptomatic. Six weeks after the first injection, a second injection was given, and there has been no recurrence of symptoms since.

Dingman[6] described the findings in severe traumatic arthritis of the temporomandibular joint as similar to those in atrophic arthritis; that is, there is erosion or destruction of the meniscus, atrophy of articular bone ends, and sometimes, eventually, fibrous or bony union with ankylosis. Bony or true ankylosis can be corrected only by pseudarthrosis, by removing a segment of bone from the neck of the affected condyle, and the interposition of fascia, muscle or foreign material between the parts. Fibrous ankylosis often can be corrected by forcible opening of the mouth with the patient under anesthesia, and following this procedure by a program of exercise to maintain function.

Patients with traumatic temporomandibular arthritis sometimes have an apparent fibrous ankylosis, but actually are prevented from opening their mouths because of extreme pain. Such patients, when placed under general anesthesia, have no actual limitation of movement as a result of articular changes. In such cases it is desirable to promote movement of the mandible, so that the patient is able to masticate properly and, in addition, so that by continued use gradual modification of the joint tissues will result in a useful, functional joint.

As early as 1915, Lord[14] noted on examination of an old skull that in one temporomandibular joint there was complete loss of the articular eminence with resultant flattening of the glenoid fossa and corresponding flattening and anteroposterior elongation of the condyle. When the mandible was placed in position, all

14. Lord, F. P., Some Anatomical Deductions from a Pathological Temporomandibular Articulation. *Anat. Rec.* 9:461 (June) 1915.

the usual movements were possible, and it can be assumed that while this articulation was diseased and anomylous, it had, through use, been altered to form a working, functional joint.

If neither rest nor correction of occlusion relieves painful traumatic ankylosis, it is desirable to inject local anesthetic agents into the joint capsule, so that normal mandibular movement can take place. Several anesthetic agents have been used with varying degrees of success. Injections of 1 cc. of 2 per cent procaine hydrochloride will produce anesthesia for about three hours, 2 per cent metycaine in normal saline for about thirty hours, and intracaine in oil for about two days. Naturally, none of these agents would be satisfactory to produce sustained anesthesia, since the joint would be maintained in a constant state of inflammation by the almost constant injections. It was thought that a solution of procaine in one of the vegetable oils, such as almond oil, would liberate the procaine more slowly than an aqueous solution, and that more lasting anesthesia would result.

Proctocaine

Morgan[15] investigated the usefulness of similar agents in an attempt to relieve rectal pain postoperatively, and in 1932 he developed a preparation, known as proctocaine,* consisting of:

Benzyl alcohol	4⅛%
Procaine base	1½%
Isobutyl-para-amino-benzoate	4⅛%
Almond oil (sweet) q.s.	100%

Procaine base was used to produce immediate anesthesia and the isobutyl-para-amino-benzoate to produce lasting anesthesia. Benzyl alcohol is nontoxic, nonirritating and anesthetic. Since it is itself soluble in water and in oil, it is a valuable solvent. Since it is generally supposed that after injection vegetable oils become emulsified and are slowly absorbed, almond oil can be regarded as nontoxic.

In experiments with mice, Morgan determined that the minimal lethal dose of proctocaine was 0.31 mg. per 20 gm. of body weight, and from this he computed that the minimal lethal dose for human beings would be about 1,000 cc. Since the average dose he recommended for human beings was 20 to 30 cc. no general systemic effect was anticipated or noted when the agent was subsequently used. Morgan also advised that the agent be heated in water at about 110 F. for ten minutes before injection.

More recently Whitney and Angelo[16] made use of proctocaine in controlling pain after hemorrhoidectomy, and used 400 to 500 ampules with only one complication. This was caused, they thought, by infection carried on the needle tip.

Savin and Tyrrell,[17] in controlling intractable ocular pain by the use of retrobulbar injections of proctocaine, treated 18 patients, with success in 11 cases, moderate success in 5 cases and failure in 2 cases.

Proctocaine Used in Three Cases

It was felt that injections of proctocaine into the temporomandibular joint capsules of patients who had apparent ankylosis as a result of pain, or when other painful symptoms could not be relieved, might produce the desired lasting anesthesia. Injections of 1 cc. were used since more than this amount would not be retained in the joint capsule. To date only 3 patients have been treated. Two patients had partial painful movement and the third, who had had no relief from other forms of treatment, had complete lack of movement as a result of pain.

15. Morgan, C. N., Oil-Soluble Anaesthetics in Rectal Surgery. *Brit. M. J.* 2:938 (November 16) 1935.

*Proctocaine is prepared in the United States by the Columbus Pharmacal Company, Columbus, Ohio.

16. Whitney, E. T., and Angelo, G., Progress in Management of Hemorrhoids. *Am. J. Surg.* 62:296 (December) 1943.

17. Savin, L. H., and Tyrrell, T. M., A Preliminary Note on the Use of Retrobulbar Proctocaine Anaesthesia for the Relief of Intractable Ocular Pain. *Brit. J. Ophth.* 24:560 (November) 1940.

The bottle of proctocaine is heated in warm water, about 100 F., for a few minutes before the preparation is injected into the joint. An absolutely dry syringe and needle should be used. No subsequent pain or discomfort was noted. Anesthesia begins within a few minutes and usually lasts from two to three weeks.

The only complication was complete paralysis of one side of the face of about five hours' duration in 1 case. This was caused by injection too far inferiorly into the tissues of the parotid gland. Since all the terminal branches of the facial nerve were affected, it was assumed that the proctocaine was dispersed throughout the entire substance of the gland, causing diminution of the concentration in any one region. This accounts for the paralysis lasting only a few hours instead of a few weeks.

Naturally, there is much to be learned regarding the use of proctocaine in the treatment of painful temporomandibular joints in which acute infection is not present. Modification of the prescription may be advisable especially if a more satisfactory vehicle than almond oil is found. In 1 case, a report of which follows, repeated injections over a period of months were required to produce permanent cessation of pain.

The patient was a well developed man in his early twenties. The previous history was not significant except for bilateral acute mastoiditis at the age of 2 years. There was no evidence of oral disease and oral hygiene was good. The lower first and second molars were missing bilaterally. The patient found on awakening one morning in February 1943 that he could not open his mouth. Later in the day he was able to open his mouth, but only with severe pain. The roentgenologic diagnosis at the time, to the best of the patient's memory, was "subluxation of temporomandibular joints, bilateral, chronic, recurrent."

Intermaxillary wiring was applied and the mandible was placed at rest for one month, with subsidence of all symptoms. In two months there was a recurrence of symptoms with less "cracking" but more pain. Physical therapy produced no improvement. The patient was advised to ignore the symptoms and to return at intervals for examination.

During the following year the pain increased, and further limitations of mandibular movement occurred. There were many periods of from one-half to three hours during which he was unable to open his mouth at all. In March 1944, there was a period of five days during which he could not open his mouth because of pain. At this time the mandible was placed at rest with intermaxillary wiring for a period of three months, with no improvement.

On admission to the hospital, the patient could open his mouth about one-fourth inch and that only with great pain. In spite of the absence of some of the posterior teeth, there seemed to be no loss in vertical dimension. Roentgenograms of the temporomandibular joints were negative. Palpation of the joints disclosed grating and noisiness bilaterally.

In October 1944, 2 cc. of 2 per cent procaine hydrochloride were injected into the right joint, with complete relief on that side for about three hours. Subsequently, 1 cc. of proctocaine was injected into the left joint, but trauma to this region six days later obscured the duration of the anesthesia. An injection in the right joint produced anesthesia for two weeks. From this time on both joints were injected with 1 cc. of proctocaine every two weeks.

In early January 1945, the patient could open his mouth one inch with no pain, and one and one-half inches with slight pain. At that time a partial lower denture replacing the missing lower teeth was constructed. By late February the pain had diminished sufficiently so that there was normal mandibular motion with no pain provided injections were given every three weeks. By April 1945, all symptoms had ceased and the patient had complete function and could eat a normal diet. At the time of preparation of this report the patient had been observed for almost one year, with no recurrence of symptoms.

Summary

Most temporomandibular pathologic conditions can be classified into three groups, according to their origin, namely, systemic, oral or extrinsic.

Temporomandibular conditions of sys-

temic origin must be treated as an adjunct of whatever systemic complaint is present.

Malocclusion of the teeth is of tremendous influence in causing temporomandibular change, and satisfactory occlusion should be established before attempting to correct most problems of this nature. It has been fairly well established that closing of the bite, decrease in vertical dimension and pressure by the condyles against the external auditory meatus and occlusion of the eustachian tubes may cause dizziness and articular pains but will not result in deafness.

In cases of severe trauma to the temporomandibular articulation, especially dislocation, the joint should be placed at rest by fixation of the mandible until all symptoms subside. Chronic recurrent dislocation, or subluxation, sometimes will respond to rest by fixation of the mandible, and should be so treated before other methods of management are instituted.

When acute pain is present, fixation of the mandible by the use of intermaxillary wiring should be performed and retained until the symptoms subside or maximum improvement results.

Chronic recurrent dislocation, or subluxation, of the temporomandibular joint of traumatic origin, which does not respond to other forms of therapy, frequently can be relieved by injection into the joint capsule of fibrosing agents, especially sodium psylliate.

Apparent ankylosis of the temporomandibular articulation as a result of prolonged pain, often can be relieved by injection into the joint capsule of an anesthetic oil, usually proctocaine, and by continued movement a functional articulation may result.—*U. S. Naval Hospital.*

●

Leukoplakia.—The manifestations of leukoplakia on the palate are not always similar to those on the tongue or buccal mucosa.

Papular leukoplakia of the palate has not been generally recognized in this country, and some of the earlier cases were reported under other diagnoses.

Undoubtedly the condition would be observed oftener if routine examinations of the palate were made, and it would be recognized more frequently if physicians and dentists were familiar with this clinical variant of leukoplakia.

The papular form presents a striking clinical picture. In this form there are gray flat-topped papules or red hemispheric papules.

The histologic observations include thickening of the epithelium with hyperkeratosis and dyskeratosis; elongation and thickening of the rete pegs, usually accompanied with capillary enlargement in the papillary bodies, and a moderate degree of inflammatory change in the dermis.

Practically all reported instances have been in men, almost all of whom have been smokers, especially pipe smokers. Syphilis does not seem to be a causative factor.

The condition has been cleared up in some cases merely by abstaining from smoking, while in others a protective denture covering the palate has been effective.

The prognosis is good, since in none of the relatively small number of recorded cases has malignant change developed.—*Clyde L. Cummer, "Leukoplakia (Leukokeratosis) of the Palate, Papular Form: Its Relation to the Use of Tobacco," J.A.M.A. 132:498 (November 2) 1946.*

THE Journal OF THE
AMERICAN DENTAL ASSOCIATION

FEBRUARY 15, 1947 • VOLUME 34 • NUMBER 4

HAROLD HILLENBRAND, D.D.S., *Editor*

Published by the American Dental Association • 222 East Superior St. • Chicago 11, Ill.

EDITORIALS

THE NEW CONGRESS: PROSPECTS FOR DENTAL LEGISLATION

THE reorganization of Congress, which became possible after the elections of last November and which was initiated immediately after the start of the new session on January 3, has many implications for dentistry and the other health professions. The federal government began making definite efforts toward the development of a national health program in 1938. Since that time these efforts have been continued and intensified, culminating, in the last session, in the third Wagner-Murray-Dingell bill, which proposed the establishment of a national system of compulsory health insurance. The objectives of this drive for improved national health met with almost universal approval, but the methods by which this objective was to be achieved were almost continually under fire from both the public and the professions. Added to this dissatisfaction with the methods proposed was the lack of any initiative on the part of the government to confer with the professions in an attempt to conciliate the divergent opinions and programs. The result of this maneuver and countermaneuver was to delay legislation needed to make a constructive beginning on the vast problems involved in improving national health.

The outlook in the present session of Congress is more optimistic. It is highly unlikely that a national compulsory health insurance bill, such as the Wagner-Murray-Dingell bill, will have much chance to move down the road of enactment. Preliminary statements and reports also indicate that although efforts will be made to secure constructive health legislation, these efforts will be based on a reasoned scientific approach to the problem. Most observers agree that there is small probability of success for any program which involves total domination of the state by the federal government in matters relating to health.

The prospect for the enactment of sound dental legislation is good. The dental research bill, sponsored during the last session by the American Dental Association and passed by one house, has already been introduced. The new bill, S. 178, is identical in all of its provisions with S. 190, introduced last year. It is sponsored

by Senators Taft, Morse, Murray, Pepper and Aiken. The need for such legislation has been so clearly demonstrated and the provisions of the bill have been so widely applauded by all interested groups that the bipartisan support which the bill has achieved in this session can be an important influence in securing early enactment.

The second dental health bill (S. 1099) sponsored by the American Dental Association in the last session has also been introduced again. This bill will probably come to hearings later in the session when other legislation on health problems is being considered. The introduction of a comprehensive health bill by Senator Taft and others is almost a certainty. Preliminary information indicates that most of its provisions will be acceptable to the professions and that their help was sought in drafting it. It is understood that dental provisions, modeled upon those in the two bills sponsored by the American Dental Association, will be included in Senator Taft's proposal. THE JOURNAL will publish the texts of these health proposals as soon as they become available.

The present Congress has an unusual opportunity for designing a constructive health program. It is to be hoped that strong leadership will be asserted so that long delayed federal support may be granted in the interests of better national health.

RETIREMENT OF TWO MEMBERS OF COUNCIL ON DENTAL THERAPEUTICS

EVER since its establishment in 1930, the Council on Dental Therapeutics of the American Dental Association has had the active cooperation of outstanding authorities in the field of the health sciences in the furtherance of its program. Because this program was so directly concerned with pharmacology, biochemistry, physiology and bacteriology, the Council has long had as members scientists who had distinguished themselves in various fields. Two of these, Milan A. Logan, Ph.D., professor of biochemistry and head of the Department of Biochemistry, School of Medicine, University of Cincinnati, and J. Howard Brown, Ph.D., D.Sc., associate professor of bacteriology, Johns Hopkins University, have recently announced their retirement from the Council on Dental Therapeutics.

Dr. Logan was a charter member of the Council, while Dr. Brown has participated in its activities since 1933. Dr. Logan has done significant work in regard to the application of compounds of calcium and phosphorus in dentistry and has taken an active part in the routine biochemical investigations of the Council. Dr. Brown has developed many improved test procedures which are used in the evaluation of germicides and disinfectants. He has also served as a consultant in the many bacteriologic problems that have been encountered by the Council.

These two men, along with their colleagues from outside the dental profession who are members of the Council, have rendered an outstanding and important service. By their unselfish interest and devotion to the problems of dentistry they have given sustained evidence of the productive cooperation that is so essential to all of the health professions. They have made important contributions to the work of the Council on Dental Therapeutics and, in a wider sense, have given of their valuable services to the advancement of the dental profession and the public that it serves. The American Dental Association acknowledges the work of Dr. Logan and Dr. Brown with appreciation and gratitude.

A. D. A. AFFAIRS

A.D.A. MEMBERS MUST PAY 1947 DUES BY MARCH 1

American Dental Association dues were payable January 1 for all members, but the Association allows members a two-month period of grace which terminates March 1. Subscription to THE JOURNAL will stop on March 1 for any member who has not paid his dues, and he will be dropped from the membership rolls. After March 1, a former member can be reinstated only through his state dental society.

RESEARCH COMMISSION SEEKS ADDITIONAL STAFF ASSOCIATE

The Research Commission of the American Dental Association has obtained permission from the National Bureau of Standards to add another research associate to the Bureau staff. Applications from qualified dentists are now being sought.

Applicants should be interested in research on dental materials and be able to present research papers before professional groups. Consideration will be given to dentists with extensive clinical experience who can meet the requirements of the District of Columbia dental examining board.

The National Bureau of Standards has established a fully equipped dental operating room and prosthetic laboratory with material loaned by the Naval Dental School, Bethesda, Md. The research associate will conduct experimental and clinical research and will study the science of dental materials much as he would in a postgraduate educational institution.

Inquiries should be addressed to Daniel F. Lynch, secretary, Research Commission, American Dental Association, 1678 Primrose Road, N.W., Washington 12.

DENTAL THERAPEUTICS COUNCIL TO MEET MARCH 7-8 IN CHICAGO

The Council on Dental Therapeutics of the American Dental Association will hold its annual meeting March 7-8 at the Central Office of the American Dental Association in Chicago, Donald A. Wallace, secretary of the Council, has announced.

Members of the Council are: Harold S. Smith, Chicago, chairman; Paul J. Hanzlik, San Francisco; F. D. Ostrander, Ann Arbor, Mich.; Harry Lyons, Richmond, Va.; Arno B. Luckhart, Chicago; H. Berton McCauley, Rochester, N. Y.; Charles Sheard, Rochester, Minn.; Thomas J. Hill, Cleveland; Lester W. Burket, Philadelphia; Edward C. Dobbs, Baltimore, and Victor C. Myers, Cleveland.

STERLING V. MEAD HONORED AT TESTIMONIAL DINNER

Sterling V. Mead, president of the American Dental Association, was honored recently at a testimonial dinner in Washington, D. C. More than 400 dentists and high-ranking government officials attended the dinner meeting given by the District of Columbia Dental Society.

Speakers who praised Dr. Mead's activities in the field of dentistry included Joseph A. Madden, president of the District of Columbia Dental Society; Rear Admiral Alexander G. Lyle, Assistant Chief for Dentistry of the Navy Bureau of Medicine and Surgery; Maj. Gen. Paul R. Hawley, Chief Medical Director of the Veterans Administration; and Rear Admiral Clifford A. Swanson, Surgeon General of the Navy.

Chase-Statler Photo

Dr. Mead Testimonial

Sterling V. Mead, left, president of the American Dental Association, is shown receiving a pair of book ends from Rear Admiral Alexander G. Lyle, Assistant Chief for Dentistry of the Navy Bureau of Medicine and Surgery. The book ends were presented as a gift from the U. S. Navy Dental Corps at a recent testimonial dinner held by the District of Columbia Dental Society for Dr. Mead

J. HOWARD BROWN RESIGNS FROM DENTAL THERAPEUTICS COUNCIL

J. Howard Brown, associate professor of bacteriology, Johns Hopkins University, and chairman of the Council of the American Association of Medical Milk Commissioners, has resigned his position as a member of the Council on Dental Therapeutics of the American Dental Association.

Dr. Brown has been a member of the Council since 1933. He was a member of the Council on Pharmacy and Chemistry of the American Medical Association from 1935-1944. He recently has been invited to speak at the International Congress on Microbiology at Copenhagen next July.

CHRISTMAS SEAL CAMPAIGN RETURNS STILL COMING IN

Partial receipts from the annual sale of Christmas Seals for the Relief Fund of the American Dental Association reached $21,788 on January 15, with returns still piling up faster than they could be counted.

It is urgent that returns this year top last year's total because of the high level of funds needed for the many dentists released recently from the armed forces. Contributions on January 15, 1946, were $32,618.

Returns still may be made in the envelope accompanying the seals to the Relief Fund, American Dental Association, 222 East Superior St., Chicago 11.

STATE SOCIETY NOMINEES MADE A.D.A. LIFE MEMBERS

The following members, nominated by their state dental societies in 1945 and 1946, have been placed on the life membership rolls of the American Dental Association, according to an announcement by Harold Hillenbrand, general secretary.

Any member of the American Dental Association who is made a life member of his state society can be nominated by the state society for life membership in the national Association. Election is by a majority vote of the House of Delegates.

A life member, who is not required to pay the American Dental Association dues, has all the rights and privileges of an active member, including an annual subscription to THE JOURNAL. The member must have reached the age of 65 years and have paid dues to the American Dental Association for twenty-five years.

Life members are: F. P. Adams, Elkhart, Ind.; R. A. Adams, Denver; J. Clarence Allen, Springfield, Mass.; C. A. Allenworth, Canton, Ohio; F. A. Amundson, Duluth, Minn.; L. Pierce Anthony, LaGrange, Ill., at large; Arthur D. Appel, Cleveland; G. N. Appleton, Albany, N. Y., and Theodore Ashley, Canon City, Colo.

E. I. Backus, Colorado Springs, Colo.; Clayton G. Bailey, Lansing, Mich.; Roy E. Bailey, Pontiac, Mich.; Garner T. Baldwin, Cleveland; James M. Barcus, Carlinville, Ill.;

Frank G. Barney, Springfield, Mass.; E. J. Bast, Milwaukee; Oren W. Bates, Buffalo; G. G. Baumgartner, Milwaukee; C. A. Beck, Mt. Vernon, Ohio; W. G. Benjamin, Minneapolis; Irwin R. Benner, Barberton, Ohio; F. G. Beroset, Toledo, Ohio; C. S. Bigelow, Evanston, Ill.; Frank D. Birtwistle, New Bedford, Mass.; George E. Bishop, Cleveland; Carl Blair, Youngstown, Ohio; L. W. Booth, Milwaukee; A. W. Boyd, Cambridge, Ohio; T. O. Braafladt, Cloquet, Minn.; Joseph E. Brady, Detroit; George Brown, Glens Falls, N. Y.; H. G. Brownton, La Grande, Ore.; Edward V. Bulger, South Boston, Mass.; Russell W. Bunting, Ann Arbor, Mich.; Charles A. Burbridge, Grand Rapids, Mich., and Frank Burger, Kenton, Ohio.

Thomas C. Cannon, Detroit; Robert S. Catheron, Boston; Ivan A. Centervall, Boston; W. T. Chambers, Denver; C. A. Cheney, Fond du Lac, Wis.; Lowell C. Childs, Springville, N. Y.; Harry M. Clark, Buffalo; Harry S. Clark, Danvers, Mass.; Harold W. Clarke, Longmeadow, Mass.; Harold H. Cleaveland, Springfield, Mass.; Franklin B. Clemmer, Chicago; Roy B. Colter, Marinette, Wis.; C. W. Coover, Fort Collins, Colo.; Waite A. Cotton, New York; J. A. Counter, Sylvania, Ohio; Arthur B. Crane, Washington, D. C.; Charles N. Craner, Syracuse, N. Y.; Kent K. Cross, Denver; Robert J. Cruise, Chicago, and James Curtin, Arlington, Minn.

Reginald P. Dadkin, Attleboro, Mass.; Walter A. Davis, Boston; Walter S. Davis, Braintree, Mass.; Albert W. Day, Worcester, Mass.; Roy V. Dillingham, Lansing, Mich.; John S. Donaldson, Denver; Wilson C. Dort, Boston; George W. Douttiel, Cleveland; Adelbert N. Drury, Boston; John F. Dunn, Jr., Fall River, Mass.; Frank E. Dunster, St. Ignace, Mich.; Elwell Dwight, Toledo, Ohio, and Clarence S. Dye, Connellsville, Ohio.

I. C. Edington, Rockville Center, N. Y.; Paul B. Engel, Brooklyn; Joseph G. Fahlstrom, Minneapolis; Clarence M. Fairtile, Fall River, Mass.; N. M. Federspiel, Milwaukee; A. G. Fee, Superior, Wis.; J. G. Feltz, Canton, Ohio; Julius Filler, Brooklyn; C. C. Finney, Oshkosh, Wis.; A. H. Fleming, Louisberg, N. C.; F. E. Follett, West Lafayette, Ind.; Perry L. Fritz, Pigeon, Mich., and John A. Furbish, Boston.

Robert B. Gage, Cleveland; Howard T. Gallager, Buffalo; William D. Gans, Cleveland; M. D. Gibbs, Hot Springs, Ark., at large; Glenn E. Godfrey, Colon, Mich.; Gladstone Goode, New York; Rufus Gould, Worcester, Mass.; Frank A. Graham, Harbor Springs, Mich.; Idella E. Graves, Cleveland, and George H. Greene, Falmouth, Mass.

Peter A. Haas, Cleveland; Lee E. Haight, Bellevue, Mich.; Robert J. Haley, Springfield, Mass.; J. P. Handy, Long Prairie, Minn.; William H. Harrison, Cleveland; J. W. Hartshorn, Toledo, Ohio; E. B. Hatman, Toledo, Ohio; William H. Havey, Waltham, Mass.; George J. Hawkins, Salem, Ohio; Wilfred M. Hawkins, Detroit; A. H. Haynen, Glens Falls, N. Y.; Fred W. Heitman, Merced, Calif.; Newton W. Hiatt, Marion, Ind.; E. O. Hile, Loveland, Colo.; Simon F. M. Hirsch, Cleveland; H. F. Hoffman, Denver; John E. Hoffman, Milwaukee; H. E. Holbrook, Milwaukee; S. Robert Horton, Raleigh, N. C.; Minnie I. Howes, Indianapolis; M. T. Huber, Waterford, Wis.; S. Ellis Hudson, Detroit; H. B. Hune, Caldwell, Ohio; Fred G. Hunt, Denver, and Roger L. Hussong, Buffalo.

Eugene W. Iden, Cleveland; C. O. Jerrel, Mt. Pleasant, Iowa; Benjamin F. Johanson, Battle Creek, Mich.; Guy T. Katner, Eloise, Mich.; Varaztad H. Kazanjian, Boston; J. D. Kelly, Binghamton, N. Y., and Melville A. Kendrick, Port Huron, Mich.

Everett W. Lamkin, Lynn, Mass.; Joseph Lang, Mt. Kisco, N. Y.; W. F. Lasby, Minneapolis; Alfred A. Lauppe, Detroit; Ralph Leach, Whitman, Mass.; Charle H. LeFevre, Muskegon, Mich.; A. J. Lewis, Dayton, Ohio; W. T. Linn, Waveland, Ind.; Bertram W. Livingston, Ashland, Ohio; H. J. Livingston, Fort Collins, Colo.; E. B. Lodge, Cleveland, and M. M. Lower, Canton, Ohio.

Hector M. MacDonald, Greenfield, Mass.; J. Russell McKinnon, Boston; W. H. MacNeil, Minneapolis; J. D. Maloney, Hudson Falls, N. Y.; G. E. Markley, Toledo, Ohio; Harry A. Mason, Detroit; Joseph Massell, Boston; George L. Masters, Connersville, Ind.; Edmund W. Mayo, Holyoke, Mass.; J. C. McConkey, Canton, Ohio; John F. McDonagh, Cleveland; George F. McInnes, Cambridge, Mass.; B. H. McKeeby, Cedar Springs, Iowa; Henry E. Merrill, Boston; Arthur L. Miles, Cambridge, Mass.; C. W. Miller, New Ulm, Minn.; Henry A. Moore, Elmira, N. Y., and John C. Murdoch, Peoria, Ill.

Elof Nelson, Colorado Springs, Colo.; Mark O. Nelson, St. Paul; William A. Nichols, Medina, Ohio; W. J. Oakey, Saranac Lake,

N. Y.; J. J. O'Neil, Denver; Byron W. Palmer, Rochester, N. Y.; Charles E. Parkhurst, Somerville, Mass.; Richard E. Patterson, Detroit; E. B. Peirce, Denver; E. G. Peterson, Duluth, Minn.; Edward L. Pettibone, Cleveland; W. K. Petty, Washington, D. C.; R. E. Pfouts, Canton, Ohio; Norman E. Phelps, Coldwater, Mich.; Harry B. Pinney, Oak Park, Ill.; Charles M. Proctor, Boston, and Fred J. Prow, Bloomington, Ind.

H. G. Ramstead, Minneapolis; Hazimeh S. Rasi, Brooklyn; E. M. Read, Perry, N. Y.; Charles N. Reinig, Seattle; H. W. Remele, Crookston, Minn.; Z. T. Roberts, Denver; Forster Robinson, Lima, Ohio; J. W. Rohrer, Granville, Ohio; Max Rothenberg, Brooklyn; Willard M. Rowe, Waltham, Mass.; M. M. Rubright, North Canton, Ohio; Reinhold Ruelberg, Wellesley Hills, Mass.; Frank J. Ryan, Holland, Mich., and W. V. Ryder, Boston.

J. N. Sadler, Delphos, Ohio; A. J. Schlaefer, Milwaukee; E. L. Schlottman, Rochester, N. Y.; J. H. Setzler, Fort Collins, Colo.; W. F. Setzler, Denver; Ray L. Sexton, Grand Rapids, Mich.; L. L. Sheffield, Toledo, Ohio; Charles G. Shoemaker, Washington, D. C.; Harry B. Shuman, Boston; F. P. Simpson, Pittsfield, Mass.; O. G. Specht, Superior, Wis.; J. H. Spillman, North Tonawanda, N. Y.; H. D. Stanwood, Denver; G. A. Stegeman, Holland, Mich.; John F. Stephan, Cleveland; R. K. Stewart, Detroit; Paul E. Stiehm, Milwaukee; J. D. Sullivan, Toledo, Ohio; L. E. Summers, Minneapolis, and C. H. Tannehill, Muskegon, Mich.

H. C. Taylor, Toledo, Ohio; C. E. Taylor, Cleveland; J. H. Taylor, Flint, Mich.; J. L. C. Taylor, Newtonville, Mass.; Leila M. Taylor, Boston; Charles K. Teter, Cleveland; W. C. Teter, Cleveland; A. A. Thiele, Emmetsburg, Iowa; H. L. Thorburn, Lynn, Mass.; E. E. Tobin, Boston; J. F. Tracy, Springfield, Mass.; W. E. Traver, Rheinbeck, N. Y.; J. W. Travis, Toledo, Ohio; M. W. Trude, Hollywood, Fla., and W. L. Tucker, Buffalo.

O. C. Uttech, Jefferson, Wis.; A. Van Ark, Toledo, Ohio; E. W. Varley, Sr., Burbank, Calif.; Edmund D. Vince, Battle Creek, Mich.; Marcus L. Ward, Ann Arbor, Mich.; E. F. Warren, Denver; Ceylon F. Waters, North Tonawanda, N. Y.; S. M. Weaver, Cleveland; E. H. Weber, Lake Mills, Wis.; J. J. Welker, Toledo, Ohio; Lehman Wendell, Minneapolis; E. G. Whaley, Brooklyn; W. J. Whiteman, Detroit; E. L. Whitman, Ann Arbor, Mich.; H. D. Whitmarsh, Sr., Binghamton, N. Y.; A. B. Wigle, Detroit; A. M. Wilkes, Farmer City, Ill.; A. A. Williams, Lynn, Mass.; G. W. Wilson, Aurora, Ill.; C. G. Winchell, Ionia, Mich.; Garrett O. Wright, Glens Falls, N. Y.; J. M. Yahres, Cleveland; Edwin L. Yale, Lansing, Mich.; Henry C. Young, Washington, D. C.; O. M. Young, Marion, Ohio, and O. C. E. Zieger, Owatonna, Minn.

VETERANS ADMINISTRATION

ALL 48 STATES COMPLETE VA FEE SCHEDULE NEGOTIATIONS

The dental societies in all forty-eight states and in the District of Columbia and Puerto Rico have completed negotiations for fee schedules to be used in the Veterans Administration dental program, according to a report by the Committee on Economics of the American Dental Association.

The last states to complete approval of the fee schedules were New York, Delaware and Louisiana. No agreement has yet been reached in Alaska and Hawaii.

Eleven of the forty-eight states have accepted the national schedule established by the Veterans Administration and the American Dental Association. Variations in the schedule were negotiated at the state level by the societies in the remaining states.

Under the program, all veterans entitled to outpatient dental care for service-connected disabilities have free choice of dentists participating in the project.

The State Advisory Committee of the Wisconsin State Dental Society has pro-

moted an educational campaign on the Veterans Administration program among the dentists in the state and has enrolled more than 1,770 of the 1,997 members of the society, according to Kenneth F. Crane, executive secretary.

The chairman of the State Advisory Committee, E. C. Wetzel, Milwaukee, and dental officers of the Veterans Administration regional office in Wisconsin visited each of the state councilor districts to explain the program and to assist in the filling out of forms. Lectures, lantern slides and a question period were used to aid in clearing up points of confusion and in eliminating errors encountered in the forms submitted.

Although the Wisconsin society has made a head start in aiding the Veterans Administration program, reports from other states indicate that similar projects are under way and that a large proportion of the dentists in the various states have enrolled in the Veterans Administration dental service.

M. M. FOWLER DESCRIBES VA ACTIVITIES AND OBJECTIVES

The major objective of the Veterans Administration dental service is to provide the highest standard of dental care to eligible veterans, M. M. Fowler, assistant medical director for dental service of the Veterans Administration, said in a speech given at the Greater New York Dental Meeting recently.

Dr. Fowler said that only with the continued help of the committee and officers of organized dentistry, "particularly the component state and district societies, may we hope to carry out a successful program to provide dental care to the veteran which will be second to none and in keeping with the principles of American dentistry."

There were two outpatient dental clinics in operation at the start of World War II, in contrast to approximately one hundred at the present date, he said. "There is a completely equipped dental clinic in each of our hospitals in charge of a chief of dental service. In hospitals now in operation, the dental clinic built to care for the original patient capacity in many instances became inadequate with expansion of bed capacity. Alterations in the physical setup have been necessary in many of the existing hospitals and complete replanning has been done for the dental clinics in the seventy-six hospitals to be constructed."

Dr. Fowler pointed out that approximately 20,000,000 men and women are potentially eligible to receive dental care and that possibly half of this number will receive dental treatment as beneficiaries of the Veterans Administration.

The hospital dental service of the Veterans Administration is now being reorganized to meet the basic requirements of the Committee on Hospital Dental Service of the American Dental Association and to provide more adequate treatment contributing to the general health of the patient, including complete oral diagnosis and full mouth roentgenograms at admission, Dr. Fowler said.

"For the first time in the history of the dental profession, a dental residency program utilizing the facilities of dental schools and hospital facilities is being organized," he said. The program is planned to train dentists in the specialties of periodontia, prosthodontia and oral surgery. Pilot courses are expected to start at Veterans Administration hospitals within a few months, and it is believed that twenty-three of the forty dental schools in the country will participate in the program within two years.

"The tentative plans contemplate three years of training, consisting of a year each of junior, intermediate and senior residency. Upon completion of the course, the resident may be offered appointment in the department of medicine and sur-

gery, or he may, if he so chooses, enter private practice," Dr. Fowler said.

In conclusion, Dr. Fowler summarized as follows the steps already taken by the Veterans Administration and those projected for the future:

1. Recognition of the Veterans Administration dental service as a major service of the department of medicine and surgery.

2. Selection and screening of applicants for dental service appointments to insure the employment of dentists with above-average ability.

3. Decentralization of administrative and supervisory control of field activities to the thirteen branch offices.

4. Reorganization of outpatient service, including a new fee schedule to assure the private practitioner adequate payment for services rendered.

5. Reorganization of the hospital dental service to meet the requirements of the Committee on Hospital Dental Service of the American Dental Association and to improve standards of dental care provided hospitalized veterans.

6. Continuous education and training for full-time staff dentists.

7. Development of the dental residency program to provide specialized training.

8. A continued policy of close cooperation and good professional relationships with local, state and national dental societies.

GROWTH OF VA DENTAL PROGRAM DEMONSTRATED BY DR. HAWLEY

The growth of outpatient dental care for veterans with service-connected disabilities under the dental service program of the Veterans Administration has been demonstrated by figures released by Paul R. Hawley, chief of the Veterans Administration medical service.

Pending applications for treatment increased from 107,000 at the end of July 1946 to 207,000 by December 1, 1946. The value of authorized treatments last July 31 was $620,000, of which $459,000 was paid to participating dentists on a fee basis and the remainder of which represented the value of treatments in Veterans Administration clinics, Dr. Hawley said. On November 30, the amount rose to $1,953,000, of which $1,759,000 was paid to participating dentists on a fee basis.

LEGISLATION

PRESIDENT ASKS INCREASED OUTLAY FOR HEALTH, WELFARE

President Truman, in his budget message to Congress, urged the creation of a "well-integrated, yet flexible, Cabinet department of health, education and social security" to supersede the operations of the Federal Security Agency.

He also recommended, for the fiscal year 1948, an outlay of $1,654,000,000 for public welfare. This expenditure is an increase of $84,000,000 over the $1,570,000,000 for social welfare, health and security in the budget for the fiscal year ending June 30, 1947.

The President urged Congress to "enact a health insurance program which will make adequate medical care available to everyone and provide protection against the economic hardships of sickness." He said that such a program should be entirely self-financing through payroll contributions.

"In spite of the achievements of the past eleven years in promoting the health, welfare and social security of the American people, much remains to be done. Our present program affords but partial protection against the major causes of insecurity; large segments of the population are excluded from its benefits. We have not yet done enough to secure good health for the nation," the President said.

He said that recent legislation for hos-

pital construction, more activity in mental health and expansion of maternal and child services are steps toward improving the "substandard health level of a large part of the population. But the major problem of financing health care still persists."

The itemized budget for social welfare, health and security included unemployment and accident compensation, retirement and dependency insurance, assistance to the aged and other special groups, promotion of public health, and crime control and correction.

BILL INTRODUCED TO SET UP NEW CABINET DEPARTMENT

A bill proposing the establishment of a new Department of Health, Education and Security in the Cabinet was introduced in the Senate by J. William Fulbright, Arkansas, and Robert A. Taft, Ohio, shortly after President Truman's budget message was presented to Congress.

The bill would put all health, social security and educational functions of the government under supervision of the new Cabinet officer.

TWO HEALTH BILLS ARE INTRODUCED INTO CONGRESS

Two bills pertaining to dental health have been introduced into the Senate of the 80th Congress. Both bills are patterned on proposed legislation which failed to pass the 79th Congress.

A bill authorizing the appropriation of $2,000,000 for the erection and equipment of a national institute of dental research and $730,000 annually for dental research was introduced January 13 by Senators James E. Murray, Montana; Claude Pepper, Florida; Robert A. Taft, Ohio; George D. Aiken, Vermont, and Wayne L. Morse, Oregon.

The bill, S. 176, was introduced originally by Senator Murray in 1945 and was numbered S. 190. The research provided for in the bill would be conducted under the direction of the Surgeon General of the U.S. Public Health Service at the National Institute for Dental Research, to be created as part of the National Institute of Health, Bethesda, Md.

The bill would also create the National Dental Research Advisory Council, to consist of six members appointed by the Surgeon General with the approval of the Federal Security Administrator. The members would be selected from leading dental, medical and scientific authorities.

The second bill, S. 178, was introduced by Senators Pepper, Murray and Aiken on January 13. It was introduced originally in 1945 by Senators Aiken and Pepper and was numbered S. 1099. The bill authorizes the appropriation of funds to states and their political subdivisions for the establishment of programs of dental health education and dental care.

The bill would amend the Public Health Service Act so that funds earmarked for dental purposes can be appropriated by Congress. The program would be carried out under the general supervision of the U.S. Public Health Service in consultation with a national dental health council, to consist of the Surgeon General, the Assistant Surgeon General (Dental) and six appointed members, a majority of whom shall be "leading dental authorities."

The council would review projects submitted to it or initiated by it and would recommend to the Surgeon General any project which would aid in the "prevention, treatment and control of dental diseases." The bill provides for grants-in-aid to the states and subdivisions for the establishment and maintenance of measures for the prevention, treatment and control of dental diseases. This would include child dental health programs, the training of personnel for local dental health projects and the setting up of public educational programs.

Cleveland Health Museum Photo

Child Health Display

The Child Dental Health Display, sponsored by the Cleveland Dental Society, is pictured as it was shown during the American Public Health Association exhibition. The models were built in the Cleveland Health Museum studios, where they are now on display

DENTAL SOCIETIES

NORTHWEST DENTAL MEDICINE CONFERENCE TO MEET MAY 18-21

The annual meeting of the Northwest Conference in Dental Medicine will be held at the Harrison Hot Springs Hotel, Harrison Hot Springs, B. C., Canada, May 18-21, according to C. R. Hallman, Vancouver, secretary-treasurer.

The meeting will be devoted to the presentation and discussion of the latest advances in the fields of dentistry and medicine. The conference is an organization set up to develop the principles of prevention and their practical application in dental and medical practice.

LATEST DENTAL SOCIETY ACTIVITIES AND MEETINGS

California.—The June examination by the California State Board of Dental Examiners will be held June 16 at the College of Dentistry, University of Southern California, Los Angeles, according to Kenneth I. Nesbitt, secretary. The examination was formerly scheduled to take place June 9.

The annual meeting of the California Dental Society will be held April 28-30 in San Francisco.

District of Columbia.—The annual spring meeting of the District of Columbia Postgraduate Clinic, sponsored by the District of Columbia Dental Society, will be held March 10-13 in the Statler Hotel, Washington. The program will include selected essay type programs, limited attendance clinics, fifty table clinics and a variety of health, educational and scientific exhibits.

Members of the committee for the Clinic are: James J. Greeves, general chairman; John A. O'Keefe, vice-chairman; Edward D. Leifer, advisory chairman; Israel Shulman, secretary; Daniel F. Radice, treasurer; William B. Ingersoll, exhibits; Walter A. Rath, clinics; J. Garrett Reilly, promotion, and James W. Bernhard, entertainment.

Florida.—F. P. Meyer, St. Petersburg, was elected president of the Florida State Dental Society at the recent annual meeting. Other new officers for the coming year are: Horace L. Cartee, Miami, president-elect; T. C. Henslee, Miami, first vice-president; Alvin J. Fillastre, Lakeland, second vice-president; John I. Todd, Jacksonville, secretary-treasurer, and Robert Thoburn, Daytona Beach, librarian.

The Florida State Board of Dental Examiners will hold its next meeting June 30-July 3 in Jacksonville, according to A. W. Kellner, Hollywood, secretary of the board.

Louisiana.—The Council on Dental Health of the Louisiana State Dental Society will hold a three-day workshop March 7-9 at the St. Charles Hotel in New Orleans. All members of the dental profession are invited to take part in a program of dental health planning and discussion.

The next meeting of the Louisiana State Dental Society will be held April 10-12 in New Orleans, according to J. S. Bernhard, Shreveport, secretary.

The New Orleans Dental Forum, held recently at the School of Dentistry, Loy-

ola University, recorded the largest attendance in its history. A. W. Sears, Jacksonville, Fla., conducted a two-day clinic on inlays, crowns and bridgework, and George H. Hauser and Paul Cook of the state health department demonstrated the effectiveness of the state dental caries control and diagnostic service.

Maine.—The State Board of Dental Examiners will meet March 1-2 in Augusta, according to R. A. Derbyshire, Skowhegan, secretary.

The Maine Dental Society has gone on record as approving the principle of dental trailers to serve people in rural districts. One trailer has been purchased by the Maine Division of Dental Health and demonstration programs will be set up in various sections of the state to develop interest in this type of dental service, according to Alonzo H. Garcelon, director of the Division of Dental Health.

Minnesota.—The Council on Dental Health of the Minnesota State Dental Association has voted to designate the fee schedule accepted by the Veterans Administration as the schedule to be used in all dental care programs supported by tax funds.

The 1947 annual meeting of the Minnesota State Dental Association will be held February 24-26 in Minneapolis. Among the speakers at the session will be George Paffenbarger, National Bureau of Standards, Washington, D. C., and Isaac Schour, College of Dentistry, University of Illinois. A total of 150 table clinics will be held on two separate afternoons.

DENTAL SCHOOLS

WASHINGTON UNIVERSITY DENTAL ALUMNI TO MEET FEBRUARY 21-22

The Dental Alumni Association of the School of Dentistry, Washington University, St. Louis, Mo., will hold its eighty-first annual meeting February 21-22 in St. Louis.

The program will include a lecture on complete dentures by Corwin Wright, Ann Arbor, Mich., and a symposium on oral diagnosis, according to V. P. Thompson, Webster Groves, Mo., secretary.

DENTISTS DISPLAY ART WORK AT NEW YORK UNIVERSITY

An art display of paintings, sculpture and photography by dentists was held at the recent Alumni Day meeting at the College of Dentistry, New York University.

Charles Berger, the arranger of the show, explained that the dental profession has turned to art work in the past few years as a hobby designed to break down tension and to sustain interest in dentistry.

The College of Dentistry has announced the publication of the second edition of *Oral Diagnosis and Treatment* by Samuel C. Miller with contributions by thirty authors. Dugald E. S. Brown, professor of physiology, has taken a year's leave of absence from the college to serve as director of the Bermuda Biological Station for Research.

The dental building at the university has been redecorated with new equipment and lighting fixtures in most of the clinics. The physiologic chemistry laboratory has been entirely remodelled and re-equipped.

FEDERAL AGENCIES

GOVERNMENT AGENCY TERMINATES SPECIAL VETERAN PRIORITIES

The Civilian Production Administration of the Office of Temporary Controls has announced a sweeping amendment to Priorities Regulation 28 which terminates special rating assistance to veterans and small businessmen.

The agency ruled that it would no longer issue CC ratings for production materials, maintenance, operating and repair supplies, capital equipment or construction materials.

CC ratings already issued will remain valid, according to the CPA, and ratings will continue to be issued to meet nondeferable military needs and essential community needs and to maintain or increase products in critically short supply.

GOVERNMENT RELEASES CONTROL OF PENICILLIN DISTRIBUTION

The Civilian Production Administration has released penicillin from all distribution control because production is now adequate for all domestic and export requirements, according to CPA officials.

Distribution of penicillin was first placed under control in July 1943, when 80 per cent of the output went to the armed forces.

SIMPLIFIED RECOMMENDATION FOR HYPODERMIC NEEDLES PROPOSED

A voluntary Simplified Practice Recommendation covering gages, lengths and types of medical and surgical hypodermic needles for hospital use has been submitted to manufacturers and representative hospitals for comment or approval, according to an announcement from the National Bureau of Standards.

Copies of the list may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington 25.

COPIES OF DENTAL BUR STANDARDS ARE AVAILABLE

Printed copies of the Simplified Practice Recommendation R195-46 on dental excavating burs are now available, according to the Division of Simplified Practice of the National Bureau of Standards.

The recommendation, which was issued first in June 1942, reduced the standard bur numbers from seventy-five to eighteen. Production was limited to this number during the war. The revised recommendation will increase the number to forty-seven, twelve of which are for shapes not in the previous issue.

Copies of the recommendation may be secured from the Superintendent of Public Documents, Government Printing Office, Washington 25.

PUBLIC HEALTH

WYOMING HEALTH DEPARTMENT SEEKS A DENTAL DIRECTOR

The Wyoming State Department of Health is looking for a director for its dental program. Interested applicants with at least one year of training in a public health school should write Dr. G. M. Anderson, State Health Officer, Wyoming State Department of Health, Cheyenne.

CENTRALIZED DENTAL PLAN FOR MENTAL PATIENTS RECOMMENDED

A centralized program for adequate care of the dental needs of the 29,000 patients in Ohio state mental institutions has been recommended by Hamilton B. G. Robinson, College of Dentistry, Ohio State University.

Dr. Robinson conducted a survey of the dental needs and existing facilities in the state mental institutions at the request of Frazier Reams, state welfare director, and Frank F. Tallman, Ohio state commissioner of mental hygiene.

In a report of his findings, Dr. Robinson pointed out that the dental service was inadequate at all the state mental institutions and said that the superintendents and dentists at the facilities agreed with this conclusion. Few superintendents have viewed their dental program

as part of a health service "essential to the general well-being and a possible rehabilitating factor in the psychiatric patient," according to Dr. Robinson.

An extreme shortage of dental personnel exists in the institutions, Dr. Robinson said. While the general ratio of dentists to population in Ohio is one to 1,600, the ratio in the mental institutions is one to 3,000.

"There is no centralized plan of dental care, a catch-as-catch-can program being used," the report stated. "The mental 'hurdle' added to the patient's load when he or she is sent home edentulous or otherwise dentally unpresentable is not recognized."

The report recommended that there should be at least one dentist and one dental hygienist for each 1,000 patients. In hospitals with 1,200 or less patients, a dental intern should be utilized under the direction of a part-time staff.

Other recommendations included the reorganization of hospital dental departments; the development of a program for dental internships; availability of modern dental equipment in each hospital; a unified record system; the establishment of oral hygiene programs and of a state central dental laboratory and central dental supply warehouse; a standard salary scale for dentists, interns and dental hygienists; the appointment of a dental supervisor to coordinate dental services; the distribution of a handbook of recommended dental procedures; and the encouragement of research programs in the relation between mental and oral diseases.

COLUMBUS SETS UP FIRST MUNICIPAL DENTAL CLINIC

The city health department of Columbus, Ohio, recently held an open house for the public with the establishment of the first municipal dental clinic the city has ever had.

The chief of the dental division is Andrew Inhoff, first full-time dentist employed by the city.

Other clinics exhibited by the health department at the open house included tuberculosis, venereal disease, prenatal and well-baby. The health department also has a food inspection division, sanitary inspection, tuberculosis control and general health.

GENERAL NEWS

COMMISSION SUGGESTS DENTAL STAFFS IN ALL HOSPITALS

The Commission on Hospital Care, a nongovernmental public service committee established at the suggestion of the American Hospital Association, has just completed a two-year study of hospital care in the United States, and has issued a report on its findings.

Included in the recommendations on hospital facilities is the suggestion that all hospitals have a dental staff to examine and treat dental infections. The report gives special attention to the education of hospital administrators, the need for affiliations between medical colleges and hospitals and the training of technical and service personnel.

Thomas S. Gates, Philadelphia, is chairman of the commission. The study was conducted under the direction of A. C. Bachmeyer, Chicago.

PENICILLIN MAY PREVENT INFECTION OF HEART

Homer F. Swift, chairman of the American Council on Rheumatic Fever of the American Heart Association, revealed at the council's annual meeting in New York recently that penicillin can be an effective agent in preventing subacute bacterial endocarditis, an infection which occurs in patients with rheumatic heart disease. Almost half the cases develop after the extraction of a

tooth or an operation on the upper part of the respiratory passages.

The council advocated that all persons suffering from rheumatic fever or rheumatic heart disease receive treatments of penicillin before having a tooth extracted or undergoing any other operation on the upper part of the respiratory tract.

Members of the council, who represent medical organizations, public health agencies, social workers and child care groups, approved a policy calling for an information campaign directed at dentists and physicians, as well as the general public, regarding the value of this preventive use of penicillin. Dentists will be urged to avoid extracting teeth of patients with rheumatic heart disease unless penicillin has first been administered.

AGREEMENTS FOR STUDENT EXCHANGE ARE UNDER WAY

The Department of State is at present concluding agreements with various foreign countries to utilize the sale of surplus property abroad for programs of student exchange between the United States and the country concerned, under the provisions of the Fulbright Bill, Public Law 584.

Financial assistance may be provided for American students studying in schools in the country where credit is acquired, and for citizens of those countries to study in American institutions overseas and to travel to the United States for study.

The assistance provided by the Fulbright Bill may take the form of payment for transportation, tuition, maintenance and other expenses, but all activities must be financed with foreign currencies. The bill does not, therefore, extend to the expenses of foreign students while in the United States nor to transportation of American students to any country where the travel expense is not payable in foreign currency.

Veterans are given preference in selection. It is expected that a limited number of students will be chosen to open the program in 1947-1948. Requests for information should be addressed to the Student and Trainee Branch, Division of International Exchange of Persons, Department of State.

BRITISH PHYSICIANS OPPOSE NATIONAL HEALTH SERVICE ACT

The members of the British Medical Association have rejected the National Health Service Act passed by Parliament, which calls for the provision by the government of free hospital, medical and dental services.

By a vote of 21,184 to 17,688, the members of the association throughout the United Kingdom returned mail ballots opposing the establishment of negotiations between the British Medical Association and the government on the Act, which is scheduled to take effect April 1, 1948.

H. Guy Dain, chairman of the Council of the British Medical Association, said that the ballot returns indicated that 64 per cent of the general practitioners voted against negotiating with the government. Of the civilian physicians, more than 80 per cent of the total number voted, with 54 per cent against negotiating and 46 per cent in favor of the Act, Dr. Dain said.

Aneurin Bevan, Minister of Health, announced that his duty was to "carry out the instructions of Parliament as expressed in the Act" and said that he could no longer postpone the consultations which were a necessary preliminary to the setting up of the Act. "I am, therefore, proceeding to consult the many other interests which will be concerned in the national health service," he said.

A summary of the provisions of the National Health Service Act was published in the January 15 issue of THE JOURNAL.

WORLD DENTISTRY

POLISH DENTIST DESCRIBES LACK OF MEN, EQUIPMENT

A letter from Adam Piechowski, a Polish dentist, describing the hardships and lack of equipment in his country has been referred to the American Dental Association by a dental manufacturing firm.

Dr. Piechowski, a graduate of the University of Michigan, told of the suffering in his native city of Lublin under Nazi control and said that, of 5,000 dentists in Poland before the war, only 1,600 survived. Many of the remaining dentists are forced to work, eat and sleep in one room, and all are without instruments, dental chairs, supplies and drugs, according to Dr. Piechowski.

Scarcities and high prices have made it impossible to purchase any of the equipment so badly needed. Dental depots have been bombed or burned and factories destroyed.

Dr. Piechowski also asked for professional books and dental literature. Address Dr. Adam Piechowski, Narutowicsa 13, Lublin, Poland.

CUBAN ORTHODONTISTS LIST FIRST BOARD OF DIRECTORS

The newly formed Cuban Association of Orthodontists, founded in Havana, Cuba, now consists of thirteen active members, according to Margarita Amezaga, secretary-treasurer.

Members of the board of directors, to serve until 1948, are: Carlos Coro, president; Dario Gandarias, vice-president; Dr. Amezaga; Federico Rodriguez de la Rosa, and Pablo Vallhonrat. Honorary membership has been conferred on M. Alden Weingart, New York; E. C. Lunsford, Miami, Fla., and José Maria Bartes, Barcelona, Spain.

ENTIRE FRENCH ARMY HAS ONLY 12 DENTISTS ENROLLED

Only twelve dentists are enrolled in the entire French Army of 350,000 soldiers, according to a report from the French newspaper *Saturday Night*. The French are compelled to engage German dentists to provide care for their troops, according to the newspaper, which criticized the army's failure in health facilities.

ARMY AND NAVY

DENTAL REPRESENTATIVE NAMED FOR NINTH NAVAL DISTRICT

Cmdr. Walter W. Dalitsch has been assigned to duty as staff dental representative to the commandant, ninth naval district, Great Lakes, Ill., in order to coordinate and assist in the organization of a reserve dental program for the ninth naval district.

All navy reserve dental officers in the ninth district who have not received a letter-questionnaire mailed during November or December are asked to write Commander Dalitsch. Officers who have received the questionnaire are urged to fill it out and return it as soon as possible to the Commandant, Ninth Naval District, Staff Dental Representative, Great Lakes, Ill.

AGE LIMIT FOR TRANSFERS TO NAVY DENTAL CORPS RAISED

The age limit for naval reserve dental officers who are interested in applying for transfer to the Navy Dental Corps has been increased three years for all ranks.

Officers eligible for transfer under the increased age limit may apply regardless of the length of time that they have been on inactive duty and will not lose the precedence that they held on the date of separation. Applications for transfer should be made before March 1.

REPORTS OF

COUNCILS AND COMMITTEES

COMMITTEE ON NOMENCLATURE

PROGRESS IN NOMENCLATURE REPORTED AT MIAMI MEETING

FOLLOWING is a digest of the annual report of the Committee on Nomenclature which was presented at the eighty-seventh annual meeting of the House of Delegates in Miami, October 14-16, 1946:

The Committee on Nomenclature reports progress toward its objectives. This progress has been slowed by the pressure of work on the Committee members in their accelerated teaching and practice programs.

An effort has been made to work with committees on nomenclature in such fields as oral surgery and orthodontics. Since these organizations have been largely inactive during the war, no appreciable progress has been made in this connection.

Projects on dental nomenclature have been assigned to committee members, and material for future reports is being collected. The volume of correspondence coming into the chairman's office indicates definite interest in the work of the Committee.

The Committee's recommendations should be recognized as official for the Association, as a step toward unified language for THE JOURNAL and in teaching and toward acceptable definitions in dictionaries. If the recommendations are official, the Association's indexing and library services would also be benefited.—*Harry Lyons, Chairman.*

Editor's Note: The Committee's recommendations were adopted by the House of Delegates at the Miami meeting.

COMMITTEE ON INTERNATIONAL RELATIONS

INTERNATIONAL RELATIONS COMMITTEE BEGAN WORK IN LATIN-AMERICAN FIELD

FOLLOWING is a digest of the annual report of the Committee on International Relations which was presented at the eighty-seventh annual meeting of the American Dental Association in Miami, October 14-16, 1946:

The Committee on International Relations originally concentrated on cooperating with the cultural relations program of the Department of State, and, as this work was primarily in the Latin-American field, the American Dental Association began its planned foreign relations in the same field.

The Latin-American dental societies cooperated enthusiastically in the centennial celebrations honoring Horace Wells, the discoverer of anesthesia.

In November 1944, a special subcommittee was appointed to deal with dental problems

in China. The subcommittee conferred with Maurice William, dental adviser to the American Bureau for Medical Aid to China. The Committee on International Relations will assist the bureau in an advisory and educational capacity, with the program to be financed entirely by the bureau. After a year of study, the subcommittee recommends:

1. That the committee for China be continued as part of the Committee on International Relations.

2. That the Committee on International Relations recommend to the Division of Cultural Cooperation of the Department of State that a representative of the American Dental Association be sent to China to study the dental development.

3. That fellowships be established in the dental schools in the United States to train Chinese teachers who will return to China.

4. That the Chinese dental schools and health agencies receive THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION.

5. That Chinese students now studying dentistry in the United States be assisted by the Committee to return to China with the proper understanding of dentistry and with the knowledge of the desire of the American Dental Association to aid in the development of dentistry in China.

Victor Sears, New York, spent the spring months touring Latin America lecturing on prosthetic dentistry. In June 1945, the Guatemala Dental Association celebrated its twenty-fifth birthday, and Jose Aubertine, San Francisco, a former member of the Committee, sponsored and took to Guatemala a group of physicians and dentists who conducted special clinics for the conference. In June, George R. Moore, professor of orthodontia at the University of Michigan, lectured at the National University of Mexico City and at the dental school of Guadalajara.

In August, Edward J. Ortion, New York, went to England and France at his own expense as a representative of the Committee to help re-establish scientific and fraternal ties between the dental professions of France, England and the United States; to present dental journals and textbooks to the dental schools of France; to help re-establish relations with the *Fédération Dentaire Internationale;* and to survey the need for dental supplies and instruments in France with a view toward fusing assistance to the French in the collection of dental supplies offered by various organizations in the United States.

In August 1945, the Department of State brought to the United States Focion Febres Cordero, Caracas, Venezuela, to study dental organizations and teaching methods in the United States. At the request of the University of San Carlos, Guatemala, the Department of State sent to Guatemala Kurt H. Thoma, Harvard University; Hermann Becks, University of California, and Floyd H. Peyton, University of Michigan, to serve as visiting lecturers.

With the liberation of the European countries, the UNRRA sent Frank C. Cady to Europe to develop a satisfactory dental program. The UNRRA also assisted in sending Maury Massler and Isaac Schour to Italy to study the effects of malnutrition on the teeth and mouth tissues. John M. Griffin left for a trip through the Latin-American countries in October as a representative of the Committee and lecturer in orthodontics.

Frequent clinical tours by eminent American dentists and participation by study groups in foreign dental congresses appear to be the most satisfactory ways of keeping alive scientific interest in American dental progress. The American Dental Association should ascertain that only qualified clinicians are chosen as representatives to foreign countries.

The first government assistance made available to foreign students was under the terms of an inter-American agreement signed at a meeting of foreign ministers of the twenty-one republics at Buenos Aires in 1936. Sixteen nations had ratified this convention by 1943. Exchange of students under the convention began in 1939-1940. The appointment of students from the United States to study abroad was suspended in 1942 for the duration of the war.

Through cooperation with the Department of State, the Kellogg Foundation, the University of Michigan and the Institute of International Education, the American Dental Association has organized and prepared the second and third Inter-American Postgraduate Courses in Dentistry. Ten dentists are in the United States at present studying at the University of Michigan. Candidates for the third course are now being selected.

A total of 287 technical dental films have been translated and sent to the Pan-American countries through an arrangement between the

American Dental Association and the Coordinator of Inter-American Affairs. A second film project is now under way. Additional films on basic subjects and on public dental health are needed.

Most of the American textbooks translated into Spanish and Portuguese are out of date. Arrangements have been made with the Director of Science Service, an agency established by the Department of State, to have several dental textbooks translated.

At present there are 250 Pan-American members in the American Dental Association. The Association should be able to secure an additional 10,000 members by extending the privilege of membership to all foreign dentists.

The Committee requests that, in order to extend its activities in the foreign relations field, the annual budget be increased to at least $3,000.

The dental laws of each country should be changed to permit a foreign dentist to intern, do postgraduate work and accept a paid position in a dental clinic. The Committee hopes to make specific recommendations that will not weaken the dental acts of a country but allow foreign dentists to gain experience in a new country.—*Daniel F. Lynch, Chairman.*

BUREAU OF PUBLIC RELATIONS

TEST TELEVISION AS MEDIUM FOR DENTAL HEALTH EDUCATION

POTENTIALITIES of television in disseminating dental health information to the general public were successfully demonstrated in Chicago on November 21, by Lon W. Morrey, director of the Bureau of Public Relations, in an initial broadcast over station WBKB.

The dental program was one of a series of health programs being produced and broadcast at intervals of two weeks over the Chicago station in cooperation with the American Dental Association and the American Medical Association. A second dental program, probably on oral surgery, will be presented early this year.

Dr. Morrey used charts, large-scale models of teeth showing various dental conditions, and five sequences from a sound movie on dental health during his fifteen-minute program.

Four cameras were used in the program. Two were trained on Dr. Morrey as he talked. A third was used to pick up reproductions of charts and diagrams. The fourth recorded short sequences from the motion picture film.

The five movie sequences, each about one minute in length, included pictures contrasting the teeth of primitive man with those of modern man, action shots of dental care given British soldiers during World War II, illustrations of the use of x-ray films in dental diagnoses, photo-diagrams of the speed of action of various local anesthetics and a movie short on the importance of early and regular dental care.

Television requires a different technic on the part of the lecturer from that required for standard radio broadcasts. The use of scripts, except for rehearsals, is not permitted. The lecturer also must get used to the ever-present cameras and huge batteries of high-powered lights.

At present, television has an extremely limited audience because of the scarcity of receivers in the hands of the general public. Plans are being formulated by

the Bureau of Public Relations to continue experiments with television as a means of providing dental health education material for the general public. Special television programs, complete with scripts and necessary illustrations, films and other material, will be prepared for use by state and local societies when greater numbers of stations and receivers are available.

DENTAL ILLUSTRATOR JOINS PUBLIC RELATIONS STAFF

MRS. Jeanet Dreskin has joined the staff of the Bureau of Public Relations as a dental illustrator and will be in charge of preparation of sketches, diagrams and art work for a variety of publications of the American Dental Association.

Mrs. Dreskin, formerly of New Orleans, is a graduate of Newcomb College of Tulane University at New Orleans. She took graduate work in medical and dental illustrations at Tulane University and at Johns Hopkins University at Baltimore.

Prior to joining the Central Office staff, Mrs. Dreskin was employed in the anatomy department of the American Museum of Natural History, New York, at the Medical School, Tulane University, and at New York Lying-In Hospital. She has prepared illustrations for a number of medical textbooks and a series of large anatomic charts.

Mrs. Jeanet Dreskin, newly appointed dental illustrator for publications of the American Dental Association

CASES AND COMMENTS

Planning for Dental Care. By Harry Strusser, D.D.S., M.S.P.H., New York.

It is fully agreed that on a complete service basis we do not have sufficient manpower to care for the dental needs of the population. It must also be admitted that not all persons would take advantage of a dental service even if it were made available and given without cost.

It has been pointed out that, in planning for the control and treatment of dental diseases, the population may be divided into two specific groups: (1) those between the ages of 3 and 14 (preschool and elementary-school children) and (2) adolescents and adults up to the age of 65.

According to the census of 1940, there are 24 million children between the ages of 3 and 14. In a previous article[1] it was pointed out that over a period of several years these 24 million children can be cared for and reach a service on a maintenance basis. We may assume that there are about 2 million children in each one-year interval between 3 and 14. Thus each year 2 million children reach the age of 15, and, having had the benefit of cumulative care up to this time, are ready for service on a maintenance basis. If a ratio of one dentist per thousand persons is used, and if increment needs are estimated at 1.3 cavities a year, it is evident that additional dentists would be needed to care for the 2 million children who would be added annually to the number receiving maintenance care.

There are approximately 70,000 dentists in the United States. It has been estimated that 25,000 dentists would be needed to provide services for the 24 million children 3 to 14 years of age, leaving approximately 45,000 dentists to take care of the needs of the population between the ages of 15 and 65 (90 million persons). If the number of graduates or the facilities for dental education are increased so that 4,000 dental students are graduated annually, sufficient manpower would be available to care for the annual increment needs of the children coming into the next age group above 14 and to take the place of the annual loss of dentists because of death and retirement.

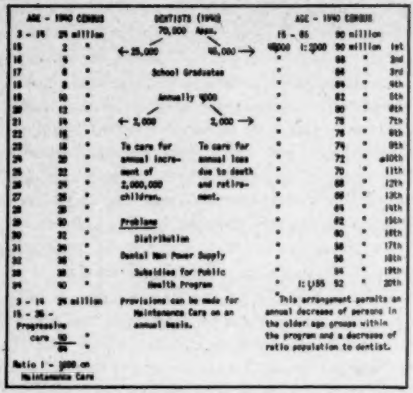
The question may be raised: Will 45,000 dentists be sufficient to care for 90 million persons? Here one must differentiate between the needs of 90 million persons and the demands for dental services, and one must further realize that the demand may be influenced by a great many factors, such as finances, mental attitudes or educational levels.

On the basis of 45,000 dentists for 90 million persons, the ratio of dentists to the population is 1:2,000. Statistical data show that at no time are more than 20 to 25 per cent of the population receiving dental care in any one year. These data reduce the ratio to one dentist to 400 or 500 of the population. Certainly a dentist can serve that many persons satisfactorily.

The population from 15 to 65 coming under this plan is reduced annually (see the accompanying chart) so that at the end of twenty years the ratio is one dentist to 1,155 of the population. It must be considered, however, that if educational facilities are increased and if the program for the younger age groups is put into effect, there will be an increased demand for dental service by the older age groups. If the demand were increased to the extent of 45 or 50 per cent, the ratio of one dentist to 400 or 500 persons would still prevail because the population in the age group 15 to 65 is continually being reduced.

Therefore, after a period of twenty years the population up to 35 years of age will have had continued maintenance care; this group of 40 million persons, plus the 24 million children 3 to 14 years of age, makes a total of 64 million under continued supervision and under a control program (see the accompanying chart). This plan places almost half of the population under controlled care and the rest on a demand service basis; the latter group will eventually be supplanted so that the entire population will be on a control and maintenance program. Of course, it must be realized that advances in research may modify plans and procedures and may disturb several of the administrative features of the program, but the experienced administrator can modify the program so that it will meet the conditions

1. Strusser, Harry, Dental Problems in Postwar Planning. *J.A.D.A.* 32:991 (August 1) 1945.


AGE - 1940 CENSUS
3 - 14 24 million
15 2 "
16 4 "
17 6 "
18 8 "
19 10 "
20 12 "
21 14 "
22 16 "
23 18 "
24 20 "
25 22 "
26 24 "
27 26 "
28 28 "
29 30 "
30 32 "
31 34 "
32 36 "
33 38 "
34 40 "
3 - 14 24 million
15 - 26 - Progressive care 52 "
66 "
Ratio 1 - 1000 on Maintenance Care
DENTISTS (1940)
70,000 Appx.
← 25,000
45,000 →
School Graduates
Annually 1500
← 2,000
2,000 →
To care for annual increment of 2,000,000 children.
To care for annual loss due to death and retirement.
Problems
Distribution
Dental Man Power Supply
Subsidies for Public Health Program
Provisions can be made for Maintenance Care on an annual basis.
AGE - 1940 CENSUS
15 - 65 90 million
45000 1:2000 90 million 1st
" 88 " 2nd
" 86 " 3rd
" 84 " 4th
" 82 " 5th
" 80 " 6th
" 78 " 7th
" 76 " 8th
" 74 " 9th
" 72 " 10th
" 70 " 11th
" 68 " 12th
" 66 " 13th
" 64 " 14th
" 62 " 15th
" 60 " 16th
" 58 " 17th
" 56 " 18th
" 54 " 19th
1:1355 52 " 20th
*This arrangement permits an annual decrease of persons in the older age groups within the program and a decrease of ratio population to dentist.

Operation of dental care plan over period of twenty years

and still keep the goal in mind. It can also be seen that, under this plan, dental care for persons 15 years of age and above can be put on a prepayment or annual payments basis.—*175 Fifth Avenue.*

Dangers of Cumulative Exposure to Roentgen Rays

To the Editor: As a practicing dermatologist, it has frequently come to my attention that some dentists are apparently unaware of the dangers to themselves of cumulative exposure to roentgen rays. This lack of caution seems to occur among both recent and older graduates from schools scattered throughout the nation.

These men do not realize that any single area of skin can tolerate only so much irradiation from roentgen rays during a person's lifetime. The effect of exposure to roentgen rays is cumulative; that is, if a dentist receives x-ray therapy for a procaine dermatitis of the hands when he is 30 years of age, and again at 35, this may be all that his fingers will stand. Further treatment by previously safe doses may be followed by disastrous sequelae of overdosage of roentgen rays—dermatitis, atrophy of the skin, difficult-to-heal painful ulceration and even squamous cell carcinoma.

The relatively minor amount of exposure in taking dental films, if the procedure is performed carelessly, may, with repetition over a span of years, have identical disastrous results to the dentist.

As a result of conversations with dentists who have consulted me because of miscellaneous types of dermatitis of the hand, this letter is being written to serve as a general warning and to suggest that the hazards of exposure to roentgen rays be more emphatically stressed at the teaching institutions.—*Norman R. Goldsmith, M.D., 230 North Duke St., Lancaster, Pa.*

"Immediate Dentures"

To the Editor: Since immediate denture service is becoming increasingly popular, is it too late to question the nomenclature? The word immediate, while definitely descriptive of the operation in that the denture is inserted immediately after extraction, does not fully describe other pertinent factors nor does it warn the patient and the operator that the immediate denture is merely an interlude during which time the immediate denture serves as a splint, a hemostat and a rehearsal or practice instrument.

The following terms are suggested, with the hope that a more accurate descriptive nomenclature will result: (1) immediate denture, (2) predenture, (3) prodenture, (4) prothesa immediamente, (5) preface denture, (6) prosthetic primer, (7) practice denture, (8) prosthetic prelude, (9) surgical denture, (10) preliminary denture, (11) original denture, (12) first denture, (13) beginner's denture and (14) treatment splint.—*Godfrey Schroeder, D.D.S., 636 Church St., Evanston, Ill.*

BOOK REVIEWS

Dentist's Appointment, Income, and Expense System. Published by George Widing, 4274 Leimert Blvd., Los Angeles 43.

The importance of accuracy in bookkeeping for the dentist cannot be overemphasized, and the correct analysis of the business side of his practice is dependent on records and the proper use of his records.

Although a small percentage of dentists use similar record systems and all systems are adaptable to the dentist's requirements, the system published by Mr. Widing merits careful study. This system is practical and is simplified to the extent that an inexperienced assistant can easily understand what to do with a minimum amount of training.

The book is divided for convenience into white, yellow and blue pages. The white section consists of appointments, receipts and cash records. The yellow pages are the monthly disbursement and expense records, and the blue page is the summary of the monthly and yearly income and expense.

For the dentist who is desirous of obtaining a concise bookkeeping system which will eliminate unnecessary duplication of effort and give complete records in one compact volume, this book is recommended.—*Lloyd H. Dodd.*

Acrylic Resins in Dentistry. By John Osborne. Ed. 2. 144 pages. 81 illustrations. Oxford, England: Blackwell Scientific Publications, Ltd., 1945.

This book has had three printings to date and is an effort on the part of the author to present, in a brief, sketchy way, the physical properties of the various dental synthetic resins which are generally used in the countries of the British Empire. No reference is made to American resins, as the book is intended primarily as a guide to British practitioners.

The author gives a concise history of the development and use of synthetic resins in dentistry, and without going into too much detail he explains the composition and manufacture of acrylic resins.

Several chapters deal rather extensively with the manipulation and physical properties of the British acrylic resins. This information should be of value to those using these products.

The second half of the book discusses the laboratory and clinical procedures involved in repairing dentures and in constructing acrylic inlays, crowns, bridges and dentures. Most of the technics given are those which have appeared in the British and American dental literature. The author gives credit to all who contributed to the development of the acrylic resins and makes no pretense of having said the last word on the subject.

The book is written in a clear, concise style and is well illustrated. It should be useful to technicians and to those dentists who desire a general over-all view of the problem of acrylic resins in dentistry. It is not to be regarded, however, as an authoritative textbook on the subject. It is too sketchy and brief for this purpose.—*Stanley D. Tylman.*

The Decay of Teeth Resulting from a Lack of Fluorine. A special report of the Massachusetts Department of Public Health. 63 pages. Paper. Boston: Wright & Potter Printing Co. (32 Derne St.), 1946.

In 1945, the Commonwealth of Massachusetts adopted an act authorizing the department of public health to make an investigation and study of all questions relating to the prevalence of dental caries and the best methods of preventing caries, especially with respect to the therapeutic application of fluorides.

The special report was prepared as a guide in carrying out the provisions of the act. The report outlines factual information on the prevalence and epidemiology of dental caries, the cost of dental care, the effects of fluorine on dental caries and the fluorine concentrations in the public water supplies in Massachusetts. The report also contains the recommendations of the Public Health Council for a continuing study of dental caries and for a comprehensive dental health program in the state.

It is especially significant to note that Massachusetts is the first state to adopt legislation designed principally to find a means for preventing or controlling dental caries.—*Allen O. Gruebbel.*

CURRENT LITERATURE

The Application to Civilian Practice of Some Dental Lessons of the Last War. Warren Harvey and Discussers. *Brit. D. J.* 81:111, August 16, 1946.

The observations of dental officers in the Royal Air Force are reviewed under the headings of prophylactic, conservative, prosthetic, operative and "miscellaneous" dentistry.

Gingivitis was present in 40 per cent of the R. A. F. personnel. The administration of ascorbic acid, nicotinic acid, riboflavin or thiamin chloride produced no beneficial results. One of the officers tried repeatedly to inoculate his own mouth with fusospirochetal organisms from infected mouths but was unable to produce similar gingival disturbances. From this observation it is inferred that acute ulcerative gingivitis results from poor hygiene and is not contagious to a healthy mouth. The use of penicillin pastilles was found to be helpful in treatment of Vincent's infection but only as an adjuvant to thorough prophylactic measures.

The use of plastics in dentures, obturators and artificial eyes is discussed. Stress is placed on the need for standardization of dental materials for both military and civilian dentistry. Attention is given to the high acid content of dental oxyphosphate cements and the consequent danger of pulp irritation.

Wide use of penicillin is reported. Albucerate, a form of penicillin with an oil and beeswax base, was packed into wounds and cystic cavities with beneficial results. There was general agreement that penicillin is a valuable therapeutic agent for mouth infections but that it is not a cure-all and should always be accompanied by thorough prophylactic and surgical measures. The indiscriminate use of penicillin by the laity and the incorporation of penicillin into dentifrices and chewing gum are questioned.—*R. W. B.*

Trends in Dentist-Population Ratios. Joseph W. Mountain and George S. Brockett. *Pub. Health Rep.* 61:1689, November 22, 1946.

The authors review the findings in other studies of dental manpower and present further statistical analyses of the number and distribution of dentists in this country. They conclude that: (1) there was a decrease in the ratio of dentists to population from 1930 to 1940; (2) the South has the lowest proportionate dental manpower; (3) the ratio of dentists to population is greater in areas having a high per capita income and in the large urban centers than in rural areas and in areas with a low per capita income; (4) there is a marked advance, since 1930, in the median age of dentists and a great increase in the percentage of those who have passed their period of greatest productivity; (5) the number of dental graduates between 1930 and 1940 was 25 per cent less than the number in the previous decade, and in 1945 the freshman enrollment was less than in any year since 1920.—*R. W. B.*

Enamel Formation in the Rat's Incisor Tooth. J. T. Irving. *Nature* 158:486, October 5, 1946.

The fact that organic enamel formation in rats on a high calcium-phosphorus ratio is easily upset by various metabolic changes has been confirmed by recent experiments. Five litters of rats were maintained for twenty-eight days on the usual Steenbock-Black diet followed by five to six days of dietary restriction. A control rat was found to show a well-marked "line test" response. The remainder of the litters were then placed back on a full Steenbock-Black diet. Animals were killed and examined at intervals up to fifteen days, depending on litter size and length of survival. Examination of the upper incisor teeth at the third day of refeeding showed that organic enamel formation had stopped. By the sixth day of refeeding and sometimes earlier, the formation of organic enamel had begun again, often very irregularly at first, with globular material replacing proper enamel matrix. The old organic enamel matrix was not laid down further. Measurements made in four of the litters showed that enamel formation had stopped at the time that the full diet was restored. The fact that the old organic enamel is associated with short ameloblasts and that it matures and calcifies, but that little more is formed, is consistent with Wassermann's concept of these cells being active in enamel maturation only.—*J. E. Gilda.*

More Light on the Pyorrhea Problem. F. W. Broderick. *Brit. D. J.* 81:81, August 2, 1946.

The author presents the history of an interesting case of a young woman, 29 years of age, who had perfect teeth and advanced periodontal disease with gingivitis, exudation of pus from the gum margins and moderate alveolar destruction. The woman was of Greek birth and was formerly a nurse in Alexandria where she had volunteered to act as a subject in an experiment in which she was given two doses of insulin daily over a period of two years. She did not have diabetes. The author calls attention to the fact that insulin acts as a hydrator of blood colloids, increasing their adsorptive qualities, and draws sugars from the blood plasma into the colloid complex. This is its action in diabetic patients, but in a healthy person it produces alkalosis.

The author treated the patient with large doses of ammonium chloride and injections of Contramine to reduce the alkalinity of the body. He mentions no prophylactic or surgical treatment. The gingival inflammation disappeared completely. Pockets of medium depth are present around some of the teeth, but the overlying gums are firm and clean.

The case is interesting from the standpoint of the occurrence, in a young person, of marked periodontal disease associated with a definite metabolic disturbance. The response of the disease to dealkalization without other forms of treatment is also remarkable.—*R. W. B.*

Osteomyelitis of the Lower Jaw and the Rational Use of Chemotherapeutic Agents. Charles D. Blassingame. *Arch. Otolaryng.* 44:377, October 1946.

The author feels that chemotherapy should be used in the treatment of osteomyelitis, not because of its effect on the local area of inflammation (which will be well walled off by the time a true diagnosis can be made), but because it will control infection entering the circulation from the original lesions. He believes that infection of the mandible and its periosteum must be treated specifically, independent of chemotherapy. Ice packs are recommended for the first twenty-four to forty-eight hours. If they fail, hot magnesium sulfate packs are suggested. At the first appearance of local abscess formation, incision is indicated and a small cotton wound applicator should be used as a probe to locate pus pockets. Antiseptics may be used. The author prefers the free use of hydrogen peroxide as a cleansing agent. He believes that radical surgical treatment should not be undertaken. Well-established osteomyelitis of the mandible is characterized by a long period required for cure, usually from two to six months.—*E. R. Costich.*

The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. III. Report of Findings for the Third Study Year. John W. Knutson and Wallace D. Armstrong. *Pub. Health Rep.* 61:1683, November 22, 1946.

This is the third report of studies on topical applications of sodium fluoride. These studies were carried out in small urban communities in Minnesota, and the ages of the subjects ranged from 7 to 15 years. Only the left quadrants of the mouth were treated, the right quadrants being used as controls.

The treatment consisted of isolating the teeth with cotton rolls and drying the tooth surfaces with compressed air. The crowns of the teeth were wetted with a 2 per cent sodium fluoride solution and allowed to dry approximately four minutes. Two-thirds of the children received two applications a week for eight weeks, a maximum of fifteen treatments, and one-third received one application a week with a maximum of eight treatments. The treatments were completed in May 1942. The treated group originally consisted of 337 children, and the control group included 392 children. The third report is based on 242 treated children who were observed throughout the three year period.

During the three year period ending May 1945, the number of permanent teeth initially attacked by caries was 36.7 per cent less in fluoride-treated than in untreated teeth. The difference observed for the first year was 39.8 per cent and for the two year period ending May 1944 was 41.4 per cent.

Among permanent teeth which were carious at the beginning of the study in 1942, the number of additional surfaces which became carious during the three year period was 23.9 per cent less in treated than in untreated carious teeth. The percentage difference observed for the first study year was 12.4 and for the two year period ending May 1944 was 23.1.—*R. W. B.*

LIST OF DENTAL OFFICERS

SEPARATED FROM ARMY DENTAL CORPS

THE following list of dental officers separated from the Army Dental Corps does not include rank because such information is no longer furnished by the Surgeon General's Office. Publication will be given to other names as soon as possible.

Alabama	
Fort Payne	Brewer, James M.
Oneonta	Brittain, Robert E.
Arizona	
Phoenix	Voorhees, Joseph P.
Pima	Buffington, Lyle W.
Winslow	Simmons, Daniel H.
Arkansas	
Camden	Tyson, Rembert A.
Little Rock	Downing, Dyle R.
California	
Berkeley	Chessall, Ralph P.
Burbank	Gunnell, Don Cutler
Downey	Gaines, Foster F.
Los Angeles	Naiditch, Leon W.
Los Angeles	Phillips, Stanton W.
Los Angeles	Sawyer, William L.
N. Hollywood	See, John A.
Ontario	Poole, Joseph D.
Pasadena	Hendrickson, Walter R.
Petaluma	Bascom, John C.
San Bernardino	Seccombe, Gordon H.
San Diego	Turrentine, L. N., Jr.
San Francisco	Bellagamba, Gerald A.
San Francisco	Cox, Barnie B.
San Francisco	Leimbach, Kenneth L.
San Francisco	Philbrick, Richard C.
San Francisco	Shoemaker, Herbert O., Jr.
Sherman Oaks	Nicholson, Grigsby
District of Columbia	
Washington	Aburrow, Harry A.
Washington	Carr, John R.
Washington	Kasnett, Shelton M.
Washington	Keil, David M.
Washington	Smith, Walter M.
Washington	Swanson, John H.
Washington	Taylor, William D., Jr.
Washington	Williamson, Harry W.
Florida	
Miami	Fox, Harold H., Jr.
Miami	Joffre, Anthony R.
Wacissa	Groom, Ruben R.
Idaho	
Lorenzo	Pierce, Ferrall M.
Illinois	
Chicago	Hessel, Arthur
Indiana	
Indianapolis	Dunlop, Walter W.
Iowa	
Davenport	Clapp, Frederick W.
Marshalltown	Collison, David S.
Kansas	
Kansas City	Cline, Cliff R.
Overland Park	Abbott, Clarence A.
Kentucky	
Brightshade	Wagers, Lyman E.
Hodgenville	Cravens, Tomoleon R.
Louisa	Smith, James M.
Ludlow	Rouse, Layton L.
Monticello	Shearer, Frank M.
Praise	Sanders, Edwin B.
Shepherdsville	Cundiff, Millard J.
Maine	
Dennysville	Johnson, Fred G.
Dexter	Hussey, Freeman L. O.
Maryland	
Baltimore	Hoffman, Barnet R.
Baltimore	Kramer, Mervin
Baltimore	Maytin, Herbert S.
Salisbury	Riggin, Harry E.
Missouri	
Joplin	Rauch, Erman D.
Windsor	Burgess, Charles H.
New Jersey	
Essex Fells	Gordon, Charles M.
New York	
Brooklyn	Brand, Bernard
Brooklyn	Dunn, Zalmen A.
Brooklyn	Regulski, Edwin S.
Buffalo	Kelsey, Harold D.
Ferndale	Seinfeld, Morris A.
New York	Allen, Alfred A.
New York	Goldwyn, Joseph
New York	Oringer, Maurice J.
Staten Island	Spivak, Bernard H.
Ohio	
Bowerston	Price, Walter N.
Canton	McConkey, Walter N.
Cincinnati	Shneider, Robert M.
Cleveland	Davidson, Herbert L.
Cleveland	Eder, Samuel
Cleveland	Schermer, Robert
Cleveland	Steiner, Louis I.
Cleveland Hgts.	Lyman, John

Cleveland Hgts.	Marsh, Max M.
Cleveland Hgts.	Maves, Theodore W.
Cleveland Hgts.	Stoor, Leo
Dayton	Schultz, Stanley R.
East Canton	Edwards, David W.
Hicksville	Hanna, George F.
Hillsboro	Hicks, Henry K.
Mt. Vernon	Shamansky, Isaac
New Matamoras	Gautschi, William I.
Newark	Shai, Joseph P., II
Newton Falls	Nabors, Dennis A.
Sharonville	Schusterson, Edward H.
South Euclid	Kreinheder, Paul E.
South Euclid	Season, Edwin H., Jr.
Springfield	Peters, George W.
Toledo	McCullough, Edward F.
Willard	Buchholz, Otto L.

Oklahoma

Kingfisher	Coggins, Luther D.
Oklahoma City	McHenry, John H.
Oklahoma City	Makins, Leo A.
Sand Springs	Trimble, Aaron R., Jr.
Stillwater	Beauchamp, Raymond O
Waynoka	McCollum, Glen W.

Oregon

Albany	Bryant, Elbert K.
Lakeview	Mayer, John J.
Portland	Snyder, Lorenzo F.
Portland	Swisher, Keath M.
The Dalles	MacNab, John A.

Pennsylvania

Allentown	Silfies, Jeremiah H., Jr.
Altoona	Pfeffer, William G.
Belle Vernon	Kunkle, Arthur A., Jr.
Bentleyville	Teale, Llewellyn J.
Berwick	Sweppenhiser, Claude B.
Bridgeport	Ritrovato, Ralph A.
Bridgeport	Weiss, Samuel
Brookville	Wallace, David R.
Butler	Tamburo, Joseph A.
Camp Hill	Greene, Thomas A.
Coatesville	Braverman, Leon L.
Darby	Martin, Raymond S., Jr.
East Mauch Chunk	Riley, Arthur M.
Elkins Park	Robinson, Herbert
Ellwood City	Plunkett, George B.
Erie	Rist, Charles M.
Gettysburg	Schultz, Granville R.
Harrisburg	Pittman, Harry R.
Harrisburg	Teperson, Sidney
Hokendauqua	Sieger, Charles F.
Homestead	Krieger, Louis
Huntingdon	Todd, William U., Jr.
Johnstown	Jaquette, Marcus M.
McKeesport	Wrobleski, Joseph W.
Mechanicsburg	Derr, Karl P.
Nanticoke	Knorr, Leon J.
New Philadelphia	Zerdesky, Clement A.
Philadelphia	Bamash, Rupert J.
Philadelphia	Cohen, Benjamin A.
Philadelphia	Dash, Abraham V.
Philadelphia	Denenberg, Samuel L.
Philadelphia	Geller, Benjamin
Philadelphia	Gillis, Leo T.
Philadelphia	Haber, David M.
Philadelphia	Kosik, Abe H.
Philadelphia	Kuziemski, Walter W.
Philadelphia	Leonard, Leo E.
Philadelphia	Levin, Harry
Philadelphia	Milanesi, James A.
Philadelphia	Moir, Walter N.
Philadelphia	Monteleone, Martin M.
Philadelphia	Rubin, Carl
Philadelphia	Russock, Sidney
Philadelphia	Spector, Joseph
Philadelphia	Squires, Morton G.
Philadelphia	Staller, Benjamin
Philadelphia	Stein, Irving
Philadelphia	Surick, Herman E.
Philadelphia	Triolo, Anthony F.
Philadelphia	Wargocki, Frank E.
Philadelphia	Weinberger, Alexander
Philadelphia	Weiss, Benjamin M.
Philadelphia	Wigdor, Leo B.
Philadelphia	Zelinger, Solomon
Pittsburgh	Jameson, John R.
Pittsburgh	Kuntz, Edward V.
Pittsburgh	Lisnow, Leonard J.
Pittsburgh	Slavkin, Milton F.
Pittsburgh	Slone, Bernard J.
Pittsburgh	Wormington, Harry
Reading	Kent, Clifford F.
Reading	Paul, Maurice B.
Reading	Silverman, Martin
Reading	Thomas, James G.
Ridgway	Summerville, William M.
Rochester	Carricato, Peter R.
Scranton	Cummings, Joseph G.
Tarentum	Wiesenbaugh, Henry A.
Uniontown	Weightman, Lloyd E.
Upper Darby	Zembrodt, Walter H.
Washington	Weller, Frederick C.
W. Chester	Rogan, James J.
Wilkes-Barre	Reichman, Joseph A.
Wilkinsburg	Bumiller, Elmer J.
Wilkinsburg	Waltz, Dwight E.
Wilkinsburg	West, James M.
Wyoming	Roberts, Daniel J.

Puerto Rico

Central Aguirre	Reilly, James T.
Rio Piedras	Velez, Franceschi H.
San Sebastian	Ballester, Pedro C.
Santurce	Oller, Jose A.

Rhode Island

Newport	Carrellas, George J.
Providence	Make, Sydney

South Carolina

Union	Bauknight, Pinkney L., Jr.

South Dakota

Corsica	Versteeg, Marsailles H.
Draper	Mueller, Henry C.
Huron	Wipf, Edmund F.

Tennessee

Bristol	Semones, James, Jr.
Chattanooga	McCown, Robert S.
Chattanooga	Warrenfells, Shannon P., Jr.
Maryville	Mount, Sam D.
Wartburg	Schubert, Russell B.

LIST OF DENTAL OFFICERS

SEPARATED FROM NAVY DENTAL CORPS

THE following naval dental officers have been separated from service, according to lists received from the Navy Department. These lists are not complete. Other names will be published as soon as possible.

	Arkansas	
Maumee	Fletcher, Burl D.	Lieut.
Rector	Alstadt, Billy C.	Lieut.
	California	
Berkeley	Fairchild, John R.	Lieut.
Compton	Andrew, M. H., Jr.	Lieut.
Costa Mesa	Andrews, Robert G.	Lieut.
Eureka	MacMillan, Neil A.	Lieut.
Glendale	Strother, Charles M.	Lieut.
La Canada	Kraus, Walter B.	Lieut.
Los Angeles	Bocarsky, Samuel B.	Lieut.
Los Angeles	Jacobs, Newton F.	Lieut.
Los Angeles	Leaf, Marvin H.	Lieut.
Los Angeles	Miller, Jerome K.	Lieut.
San Francisco	Ehikian, Richard G.	Lieut.
Sanger	Moordigian, Jacob	Lieut.
Santa Rosa	Fulgham, Richard L.	Lieut.
Selma	Peterson, Russell E.	Lieut.
Stockton	Fergusson, Robert E.	Lieut.
	Canada	
Saskatoon	Abbey, Donald C.	Lieut.
	Colorado	
Salida	Schneider, Raymond	Lieut.
	Connecticut	
Danbury	Knapp, Harold B.	Lieut.
Middletown	Mekrut, John S.	Lieut.
New Haven	Cusano, Gabriel M.	Lieut.
New Haven	Perlman, Elliott H.	Lieut.
	Florida	
Fort Meade	Strickland, Robert S.	Lieut.
Perry	McLain, Jimmie B.	Lieut.
St. Petersburg	Blanc, Robert D.	Lieut.
	Georgia	
Atlanta	Malone, Lee B.	Lieut.
Dalton	Sapp, George W.	Lieut.
Millen	Rackley, Robert H.	Lieut.
Morven	Lawson, Hulon T.	Lieut.
	Illinois	
Chicago	Bielinski, Raymond R.	Lieut.
Chicago	Jedlowski, S. W.	Lieut.
Chicago	Remijas, Richard J.	Lieut.
Evanston	MacLean, John F.	Lieut.
Riverside	Lancaster, William H.	Lieut.
Streator	Dakin, Roy	Lieut.
	Kansas	
Hutchinson	Stucky, Milo M.	Lieut.
	Kentucky	
Dayton	Hewetson, Dutton J.	Lieut.
Louisville	Hunter, Dale O.	Lieut.
	Maine	
Bangor	Morris, Robert I.	Lieut.
	Maryland	
Baltimore	Dosh, David H.	Lieut.
	Massachusetts	
Ayer	Yuill, Daniel C.	Lieut.
Brighton	Bradford, William S.	Lieut.
Brockton	Warshauer, Lloyd H.	Lieut.
Dorchester	Gavin, Richard J.	Lieut.
New Bedford	Mee, Edward J.	Lieut.
Newton Center	Wilde, John R.	Lieut.
Rehoboth	Middleton, Robert T.	Lieut.
Somerville	Gorfine, Theodore	Lieut.
	Michigan	
Benton Harbor	August, Alexander	Lieut.
Detroit	Rosen, Harold	Lieut.
Kalamazoo	Walker, Richard A.	Lieut.
	Minnesota	
Dodge Center	Bigelow, G. P.	Lt. Cmdr.
Le Roy	Morse, Elwin L.	Lieut.
Sherburn	Howard, James M.	Lieut.
Wabasso	Goblirsch, George H.	Lieut.
	Missouri	
Higginsville	Lyons, James F., II	Lieut.
Kansas City	Pfaffman, George A.	Lieut.
St. Louis	Haley, Michael R.	Lieut.
St. Louis	Hanson, Charles G.	Lieut.
St. Louis	Steinger, Charles I.	Lieut.
	Nebraska	
York	Luers, Walter H.	Lieut.
	New Hampshire	
Grasmere	Bourque, Charles V.	Lieut.
	New Jersey	
Clifton	Sindmack, R. K.	Lieut.
Collingswood	Woods, R. H.	Lt. Cmdr.
Edgewater	Sancier, Henry J.	Lieut.
Elizabeth	Weinberg, Stanley L.	Lieut.
Manasquan	Getty, Boyd C., Jr.	Lieut.
Newark	Marano, William F.	Lieut.
Paterson	Skala, Raymond J.	Lieut.
Somerville	Locke, John G.	Lieut.
Union City	Eby, Harold A.	Lieut.
	New York	
Bayside	Korwan, William A.	Lieut.

Brooklyn	Brandner, Philip	Lieut.
Brooklyn	Dene, Ralph W.	Lieut.
Brooklyn	Federman, Bernard J.	Lieut.
Brooklyn	Kagan, David M.	Lieut.
Brooklyn	Levin, Ralph	Lieut.
Brooklyn	Manganelli, R. J.	Lieut.
Brooklyn	Paloger, Raymond M.	Lieut.
Flushing	Stagg, Charles H.	Lieut.
Hollis	Jacob, Thornton N.	Cmdr.
Jamaica	Scannell, James B.	Lieut.
Kingston	Kearney, J. B., Jr.	Lieut.
New York	Esposito, Salvatore J.	Lieut.
New York	Gormley, Eugene J.	Lieut.
New York	Kraus, Jack	Lieut.
New York	Monahan, Leonard J.	Lieut.
New York	Oremland, Gustave	Lieut.
New York	Ventriglia, Vincent A.	Lieut.
Ogdensburg	MacQueen, Angus M.	Lieut.
Richmond Hill	Strum, Milton	Lieut.

North Carolina

Andrews	Jarrett, Clyde H., Jr.	Lieut.
Apex	Beavers, Franklin C.	Lieut.
Charlotte	Watkins, Thomas, Jr.	Lieut.
Madison	Lauten, John J.	Lieut.
Rich Square	Cooke, Charles S.	Lieut.
Tabor City	Todd, Hubert A.	Lieut.

North Dakota

Milnor	Halvorson, De Los G.	Lieut.

Ohio

Akron	Goodall, Donald A.	Lieut.
Cleveland	Elshaw, Edwin J.	Lieut.
Mansfield	Acomb, James R.	Lt. Cmdr.
Toledo	Brattain, Dayne	Lieut.

Oklahoma

Hollis	Cummins, Guy E.	Lieut.
Oaks	Vammen, Warren L.	Lieut.

Oregon

Milton	Harstad, William C.	Lieut.
Portland	Bowerly, Gerald J., Jr.	Lieut.
Toledo	Over, Lawrence F.	Lieut.

Panama Canal Zone

Balboa Heights	Kain, John F.	Lieut.

Pennsylvania

Bethlehem	Ludwig, Jacob H., Jr.	Lieut.
Braddock	Milligan, W. H., Jr.	Lieut.
Danville	Wintersteen, L. H.	Lieut.
Downingtown	Petrella, Arthur J.	Lieut.
Harrisburg	Heisey, Kenneth H.	Lieut.
Kane	Crossmire, George B.	Lieut.
Lansdowne	Thompson, E. A., Jr.	Lieut.
Luzerne	Krischunis, Joseph P.	Lieut.
Morrisville	Welling, Seth F.	Lieut.
Philadelphia	Jones, William B., Jr.	Lieut.
Pittsburgh	Wittich, K. C.	Lt. Cmdr.

Rhode Island

Newport	Cohen, Lawrence J.	Lieut.
Newport	Rogers, Gerald F.	Lieut.
Providence	Caldarone, Vincent E.	Lieut.
West Warwick	Juszczyk, Walter F.	Lieut.

South Carolina

Conway	Long, James H.	Lieut.
Georgetown	Brockington, W. J.	Lt. Cmdr.
Greer	Lancaster, Jas. B., Jr.	Lieut.
Spartanburg	Wilson, John O.	Lieut.

South Dakota

Okaton	Bork, Gordon H.	Lieut.
Philip	Russell, Albert L.	Lt. Cmdr.

Tennessee

Greenfield	Mayo, Thomas H.	Lieut.
Henry	Milam, Thomas R.	Lieut.
Valley Creek	Braden, Ralph E.	Lieut.

Texas

Cuero	Windel, Forrest W.	Lieut.
Floresville	Vela, Francisco I.	Lieut.
Fort Worth	Chumlea, Billy J.	Lieut.
Houston	Zimmerman, Jack	Lieut.
Nederland	Roach, F. A., Jr.	Lieut.
New Braunfels	Fischer, Harold E.	Lieut.
San Angelo	Sessums, Orval B.	Lieut.

Utah

Logan	Milligan, Horace J.	Lieut.
Tooele	Peck, Wilbur K.	Lieut.

Virginia

Arlington	Janoschka, Ralph C.	Lieut.
Newport News	Mirmelstein, H. C.	Lieut.
Richmond	Todd, Julian P., Jr.	Lieut.

Washington

Bremerton	Bechlem, Donald N.	Lieut.
Renton	Lackie, Almo L.	Lieut.
Spokane	Jurdy, Francis R.	Lieut.

West Virginia

St. Mary's	Gerber, C. R., Jr.	Lieut.
Ward	Copher, H. O.	Lt. Cmdr.

Wisconsin

Fond du Lac	Konen, Lloyd W.	Lieut.
Horicon	Kaiser, Dell L.	Lieut.
Marshfield	Schulte, Alexius F.	Lieut.
Milwaukee	Delbalzo, Mario E.	Lieut.
Milwaukee	Driss, Harold E.	Lieut.
Milwaukee	Greenberg, Myron	Lieut.
Milwaukee	Rehorst, Daniel F.	Lieut.
New Holstein	Bauman, Dolor J.	Lieut.
New Holstein	Krohn, Frederick D.	Lieut.
Silverlake	Richter, L. F.	Lieut.
Watertown	Reinhard, William W.	Lieut.
Waukesha	Evenson, Ward H.	Lieut.
Waukesha	Hulen, George R.	Lieut.
Wauwatosa	Barrie, Robert M.	Lieut.

DEATHS

Myers, E. Frank, LaFollette, Tenn.; School of Dentistry, Vanderbilt University, 1914; died October 17; aged 57.

Nissley, Daniel H., Lancaster, Pa.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1908; died October 31; aged 67.

Ocasek, William C., Berwyn, Ill.; died November 11; aged 39.

Orth, Herman A., Youngstown, Ohio; died November 13; aged 87.

Osborn, Howard B., Calcutta, India; died December 29; aged 69.

Powers, John J., Union City, N. J.; Dental Department, Baltimore Medical College, 1909; died December 2; aged 72.

Prall, J. Will, Columbus, Ind.; School of Dentistry, Indiana University, 1885; died November 6; aged 86.

Preiss, Frank C., Orange, N. J.; died December 27; aged 66.

Reese, Elmo, Dodgeville, Wis.; died December 18; aged 67.

Riddle, Napoleon B., St. Francisville, La.; School of Dentistry, Vanderbilt University, 1916; died December 1; aged 54.

Robinson, Frank E., Farmersburg, Ind.; Central College of Dentistry, Indianapolis, 1901; died November 20; aged 69.

Ross, Brant C., Danville, Ill.; Chicago College of Dental Surgery, Dental Department of Loyola University, 1905; died September 24; aged 63.

Rowe, Frank H., Concord, N. H.; School of Dentistry, Temple University, 1893; died November 16.

Schaefer, Spencer G., Beverly Hills, Calif.; died November 13; aged 68.

Schlosser, William H., Franklin, Ind.; School of Dentistry, Indiana University, 1900; died November 13; aged 68.

Shields, Robert C., Germantown, Pa.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1912; died December 12; aged 59.

Shinn, James M., Hale, Mo.; died December 9; aged 90.

Siegler, C. Louis, Doylestown, Pa.; died November 23; aged 68.

Siwa, Walter, New Orleans, La.; died November 29.

Smith, Haskell W., Lawton, Okla.; School of Dentistry, University of Louisville, 1908; died September 24; aged 70.

Sperber, Irving J., New York; New York College of Dentistry, 1919; died November 15; aged 48.

Stannard, Minot B., Ocean City, N. J.; School of Dentistry and Baltimore College of Dental Surgery, University of Maryland, 1912; died November 29.

Stapleton, Joseph W., Winchester, Ky.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1885; died November 6.

Stryker, John A., Grand Rapids, Wis.; Chicago College of Dental Surgery, Dental Department of Loyola University, 1935; died November 21; aged 36.

Swan, H. L., Brinkley, Tenn.; died November 19; aged 69.

Swykert, N. L., Laurium, Mich.; College of Dental Surgery, University of Michigan, 1905; died October 27; aged 70.

Terry, Clarence H., Shreveport, La., died November 19; aged 78.

Thomas, John F., Upper Darby, Pa.; School of Dentistry, Temple University, 1894; died November 27; aged 72.

Thorn, Allen H., Cedar Grove, N. J.; died November 25.

Titus, John K., Chicago; died December 13; aged 49.

Todd, Albert J., Geneva, N. Y.; New York College of Dentistry, 1895; died December 10; aged 73.

Tyler, D. E., Alliance, Nebr.; College of Dentistry, Creighton University, 1911; died November 26; aged 71.

Wade, Thomas B., Philadelphia; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1898; died December 18; aged 71.

Wallace, William T., Columbus, Ohio; Pennsylvania College of Dental Surgery, 1881; died December 4; aged 96.

Walsh, Augustine J., North Bergen, N. J.; New York College of Dentistry, 1892; died November 25; aged 76.

Walsh, William J., Detroit, Mich.; died November 14.

Williams, Jefferson D., Kansas City, Mo.; died November 8; aged 82.

Wolfrum, Richard, West Bend, Wis.; died October 17; aged 69.

Woodard, R. S., Stuttgart, Ark.; School of Dentistry, Vanderbilt University, 1901; died November 8; aged 69.

Wrigley, Arthur E., Eureka, Calif.; School of Dentistry, College of Physicians and Surgeons of San Francisco, 1911; died November 27; aged 58.

Zeigler, Jacob B., South Orange, N. J.; died December 8; aged 65.

DIRECTORY

Officers

Sterling V. Mead, President.....1149-16th St., N. W., Washington, D. C.
H. B. Washburn, President-Elect.....488 Lowry Bldg., St. Paul, Minn.
E. B. Penn, First Vice-President.....901 Huntington Bldg., Miami, Fla.
B. B. McCollum, Second Vice-President.....1052 W. Sixth St., Los Angeles, Calif.
M. D. Huff, Third Vice-President.....1204 Medical Arts Bldg., Atlanta, Ga.
Harold Hillenbrand, Secretary.....222 E. Superior St., Chicago, Ill.
R. H. Volland, Treasurer.....First National Bank Bldg., Iowa City, Iowa

Board of Trustees

J. B. Carr, 1949, Seventh District.....907 Hume Mansur Bldg., Indianapolis, Ind.
C. S. Foster, 1949, Tenth District.....803 Dows Bldg., Cedar Rapids, Iowa
Robert P. Thomas, 1949, Sixth District.....720 Francis Bldg., Louisville, Ky.
Henry Hicks, 1949, First District.....5 Glen Court, Greenwich, Conn.
William McGill Burns, 1948, Second District.....80 Hanson Place, Brooklyn, N. Y.
Willard Ogle, 1948, Twelfth District.....313 Medical Arts Bldg., Dallas, Texas
Fred S. Shandley, 1948, Eleventh District.....1327 Medical & Dental Bldg., Seattle, Wash.
R. C. Dalgleish, 1948, Thirteenth District.....124 State Capitol, Salt Lake City, Utah
LeRoy M. Ennis, 1947, Third District.....4001 Spruce St., Philadelphia, Pa.
Harold W. Oppice, 1947, Eighth District.....1002 W. Wilson Ave., Chicago, Ill.
C. J. Wright, 1947, Ninth District.....American State Bank Bldg., Lansing, Mich.
Edward J. Jennings, 1947, Fourth District.....126 W. State St., Trenton, N. J.
Clyde E. Minges, 1947, Fifth District.....Peoples Bank Bldg., Rocky Mount, N. C.

Section Chairmen

Operative Dentistry, Materia Medica and Therapeutics: J. Bernard Hutcherson, Starks Bldg., Louisville 2, Ky., Secretary.
Full Denture Prosthesis: W. W. Hurst, 2165 Adelbert Road, Cleveland, Ohio.
Partial Denture Prosthesis: Oliver C. Applegate, 216 S. State St., Ann Arbor, Mich.
Oral Surgery, Exodontia and Anesthesia: George W. Christiansen, David Whitney Bldg., Detroit, Mich.
Orthodontics: L. B. Higley, 705 S. Summit St., Iowa City, Iowa.
Periodontia: Hunter S. Allen, Comer Bldg., Birmingham, Ala
Dentistry for Children and Oral Hygiene: Kenneth A. Easlick, University of Michigan, Ann Arbor, Mich.
Histology, Physiology, Pathology, Bacteriology and Chemistry (Research): Hermann Becks, University of California, San Francisco, Calif.
Practice Management: Gaylord J. James, 9400 Euclid Ave., Cleveland, Ohio.
Radiology: H. C. Fixott, Medical-Dental Bldg., Portland, Ore.
Hospital Dental Service: W. Harry Archer, 804 Professional Bldg., Pittsburgh, Pa.

Chairmen of Standing Committees

Judicial Council: Ernest G. Sloman, 344-14th St., San Francisco, Calif.
Council on Dental Education: J. Ben Robinson, 42 S. Greene St., Baltimore, Md.
Council on Dental Health: Hugo M. Kulstad, 218 First National Bank Bldg., Pomona, Calif.
Dental Legislation: Carl O. Flagstad, 1549 Medical Arts Bldg., Minneapolis, Minn.
Relief Commission: John S. Owens, 407 Cooper St., Camden, N. J.
Research Commission: M. D. Huff, 1204 Medical Arts Bldg., Atlanta, Ga.
Honorary Awards and Patents: M. D. K. Bremner, 173 W. Madison St., Chicago, Ill.
Library and Indexing Service: John E. Gurley, 350 Post St., San Francisco, Calif.
National Board of Dental Examiners: James V. Gentilly, 724 Rose Bldg., Cleveland, Ohio.
Membership: Paul W. Zillmann, 29 Walden Ave., Buffalo, N. Y.
Insurance: A. D. Weakley, 1726 Eye St., N. W., Washington, D. C.
Economics: Leslie M. FitzGerald, Roshek Bldg., Dubuque, Iowa.
Council on Dental Therapeutics: Harold S. Smith, 6 N. Michigan Blvd., Chicago, Ill.
American Red Cross: George A. Coleman, 15th and Locust Sts., Philadelphia, Pa.

History: Harold L. Faggart, 2120 Pine St., Philadelphia, Pa.
Dental Museum: Henry A. Swanson, 1726 Eye St., N. W., Washington, D. C.
Nomenclature: Harry Lyons, Professional Bldg., Richmond, Va.
Constitutional and Administrative Bylaws: Percy T. Phillips, 18 E. 48th St., New York, N. Y.
International Relations: Daniel F. Lynch, 1678 Primrose Road, N. W., Washington, D. C.
Scientific and Health Exhibits: Leo F. Marré, Paul Brown Bldg., St. Louis, Mo.
Motion Pictures: Cecil C. Connelly, 4660 Maryland Ave., St. Louis, Mo.

Chairmen of Special Committees

Hospital Dental Service: W. Harry Archer, 804 Professional Bldg., Pittsburgh, Pa.
Trade Relations: Frank J. Hurlstone, 30 N. Michigan Ave., Chicago, Ill.
William T. G. Morton Centenary: Kurt H. Thoma, 53 Bay State Road, Boston, Mass.
Horace Wells Centenary: Eugene M. Clifford, 57 Pratt St., Hartford, Conn.
Woman's Auxiliary: Stella Risser, Medical Arts Bldg., Houston, Texas.
Gorgas Memorial: Russell W. Bunting, 916 Church St., Ann Arbor, Mich.
Dental and Medical Relations: C. Raymond Wells, 1 DeKalb Ave., Brooklyn 1, N. Y.
Prosthetic Dental Service: H. O. Lineberger, 804 Professional Bldg., Raleigh, N. C.
Military Affairs: Olin Kirkland, Shepherd Bldg., Montgomery, Ala.
War Memorial: L. H. Renfrow, Selective Service, 21st and C Sts., N. W., Washington, D. C.

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois
Telephone WHItehall 6730 Cable Address: ADAECO

Harold Hillenbrand, Editor **John J. Hollister, Business Manager**

All expressions of opinions and all statements of supposed facts are published on the authority of the writer over whose signature they appear, and are not to be regarded as expressing the views of the American Dental Association, unless such statements or opinions have been adopted by the Association.

Communications regarding manuscripts and editorial matters should be addressed to the Editor. Communications regarding advertising and business matters should be addressed to the Business Manager.

Advertising: All products coming within the scope of the Council on Dental Therapeutics of the American Dental Association must be acceptable to the Council in order to be advertised in THE JOURNAL.

Subscription is included in the annual membership dues of the American Dental Association. The subscription rate for nonmembers is $7.00 a year in advance for domestic subscriptions and $8.00 a year for foreign subscriptions. Remittances should be made payable to the American Dental Association.

Notice of change of address should be received one month before the change is to be effective. Old and new addresses should be given.

Articles are accepted with the understanding that they have not been published previously and that they are submitted solely to THE JOURNAL.

Manuscripts must be typewritten, double spaced, and an original copy must be submitted. Unused manuscripts are returned, but no responsibility is assumed for unsolicited manuscripts and pictures. References should give name and initials of author, volume, page, month and year of publication in the case of periodicals, and publisher and place and year of publication in the case of books. Illustrations must be clear photographs. Glossy prints are preferred. Drawings must be made in black ink on heavy paper or cardboard. Any illustrations should bear the author's name and be numbered in the order in which they are referred to in the text. Illustrations must not be pasted on the manuscript. Legends should be placed on a separate sheet. Tables are not illustrations and should be numbered separately.

A reprint order blank is mailed to the author two weeks before the article is published.

ANNOUNCEMENTS

MEETINGS OF STATE SOCIETIES

State	Date	Place	Secretary	Address
Alabama	April 8–10	Birmingham	G. W. Matthews	1922 Tenth Ave., S., Birmingham 5
Arizona	April 25–26	Tucson	B. K. Litt	68 E. Congress, Tucson
Arkansas	May 19–21	Little Rock	I. M. Sternberg	Merchants Bank Bldg., Ft. Smith
California	April 28–30	San Francisco	L. E. Linehan	450 Sutter St., San Francisco
S. California			R. L. Borland	Rm. 615, 1052 W. Sixth St., Los Angeles 14
Colorado	May 25–28	Colorado Springs	R. A. Downs	724 Republic Bldg., Denver 2
Connecticut			E. S. Arnold	37 Linnard Road, W. Hartford
Delaware			J. Krygier	309 S. State St., Dover
D. of Columbia	June 10	Washington	K. H. Wood	202-1835 Eye St., N.W., Washington
Florida			A. J. Fillastre	601 Marble Arcade Bldg., Lakeland
Georgia			J. M. Heard, Jr.	Persons Bldg., Macon
Hawaii	October	Honolulu	J. H. Dawe	P. O. Box 39, Honolulu 10
Idaho	June 9–11	Sun Valley	H. F. Miller	Moscow
Illinois	Oct. 9–11	Peoria	P. W. Clopper	623 Jefferson Bldg., Peoria 2
Indiana	May 19–21	Indianapolis	E. E. Ewbank	Kingman
Iowa	May 6–8	Des Moines	A. N. Humiston	417 Higley Bldg., Cedar Rapids
Kansas	May 12–15	Kansas City, Mo.	F. A. Richmond	1008 Huron Bldg., Kansas City
Kentucky	March 31–April 2	Louisville	J. L. Walker	640 Barbee Way, S., Louisville
Louisiana	April 10–12	New Orleans	J. S. Bernhard	407 Medical Arts Bldg., Shreveport
Maine	June 5–7	Poland Springs	A. H. Garcelon	State House, Augusta
Maryland	April 28–30	Baltimore	J. H. Shackelford	706 Baltimore Life Bldg., Baltimore 1
Massachusetts	May 5–8	Boston	P. E. Adams	106 Marlborough St., Boston
Michigan	April 14–16	Detroit	F. Wertheimer	Michigan Department of Health, Lansing
Minnesota	Feb. 24–26	Minneapolis	L. M. Gruttenden	Lowry Medical Arts Bldg., St. Paul
Mississippi	June 1–4	Biloxi	O. L. Colee	Magnolia
Missouri	May 12–15	Kansas City	C. W. Digges	Exchange National Bank Bldg., Columbia
Montana	May 1–3	Missoula	C. S. Renouard	305 Phoenix Bldg., Butte
Nebraska	May 12–14	Lincoln	F. A. Pierson	Federal Securities Bldg., Lincoln
Nevada	May 12–13	Las Vegas	L. G. Jacob	505 Chestnut St., Reno
New Hampshire	June 15–17	Portsmouth	F. E. Williams	814 Elm St., Manchester
New Jersey	April 27–30	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico	May 26–28	Santa Fe	J. S. Eilar	First National Bank Bldg., Albuquerque
New York	May 13–16	Buffalo	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina	May 4–7	Pinehurst	C. W. Sanders	Benson
North Dakota			K. G. Allen	602 Black Bldg., Fargo
Ohio	Nov. 9–12	Cleveland	E. G. Jones	185 E. State St., Columbus
Oklahoma	April 13–16	Oklahoma City	E. W. Wise	Medical Arts Bldg., Tulsa
Oregon	June 5–7	Portland	W. H. Hurley	922 Selling Bldg., Portland 5
Panama Canal Z.			T. W. Cagle	Box 243, Cocoli
Pennsylvania	May 6–8	Philadelphia	E. R. Aston	421 Market St., Kingston
Philippine I.			G. A. Carreon	9 Broadway, Third St., N. Manila
Puerto Rico			R. Miranda	Box 747, Rio Piedras
Rhode Island			M. B. Messore	707 Union Trust Bldg., Providence
South Carolina	April 27–29	Myrtle Beach	J. R. Owings	Greenville
South Dakota	May 29–31	Custer	E. W. Elmen	Sioux Falls
Tennessee	May 12–15	Nashville	E. J. Justis	Exchange Bldg., Memphis
Texas	April 28–May 1	San Antonio	W. Ogle	313 Medical Arts Bldg., Dallas
Utah			S. Ballinger	401 Medical Arts Bldg., Salt Lake City
Vermont	May 25–27	Woodstock	J. A. Larrow	Middlebury
Virginia	April 14–16	Roanoke	J. E. John	804 Medical Arts Bldg., Roanoke
Washington	May 5–7	Spokane	F. J. Dingler	1502 Medical & Dental Bldg., Seattle 1
West Virginia	May 19–21	Bluefield	C. J. Gavelda	Clarksburg
Wisconsin	March 31–April 2	Milwaukee	K. F. Crane	1235 Bankers Bldg., Milwaukee 2
Wyoming			J. D. McNiff	208 Grand Ave., Laramie

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
California	June 16	Los Angeles	K. I. Nesbitt	515 Van Ness Ave., San Francisco 2
Connecticut	March 11–15	Hartford	C. G. Brooks	302 State St., New London
Florida	June 30–July 3	Jacksonville	A. W. Kellner	P. O. Box 155, Hollywood
Iowa	March 17–22	Iowa City	H. G. Bolks	923 Badgerow Bldg., Sioux City
Maine	March 1–2	Augusta	R. A. Derbyshire	Box 387, Skowhegan
Mississippi	June 17–19	Jackson	W. R. Madden	Forest
Ohio	March 10–13	Columbus	E. D. Lowry	79 E. State St., Columbus
Oregon	March 3–6	Portland	F. L. Utter	506 Pioneer Trust Bldg., Salem
Pennsylvania	Feb. 17–22*	Philadelphia	R. E. V. Miller	61 N. Third St., Easton
South Carolina	July 7	Columbia	E. G. Bumgardner	1517 Hampton St., Columbia 29
West Virginia	June 25–26	West Liberty	R. H. Davis	510 Goff Bldg., Clarksburg

*Feb. 17–19, written (dental); Feb. 18–19, written (hygienists). Feb. 20–22, clinical (dental); Feb. 20, clinical (hygienists).

OTHER MEETINGS

Name	Date	City	Secy. or Chm.	Address
American Association of Orthodontists, Central Section	April 14–15	Minneapolis	C. R. Baker Chm.	636 Church St., Evanston, Ill.
American Dental Association	Aug. 4–8	Boston	H. Hillenbrand Secy.	222 E. Superior St., Chicago
American Dental Society of Europe	August 1948	London	K. C. Campbell Secy.	88 Portland Place, London, W.1.
American Society for the Advancement of General Anesthesia in Dentistry	March 24	New York	M. H. Feldman Ex. Secy.	730 Fifth Ave., New York
Northwest Conference in Dental Medicine	May 18-21	Harrison Hot Springs, B. C.	C. R. Hallman Secy.	4298 Dunbar St., Vancouver, B. C., Canada
District of Columbia Postgraduate Clinic	March 10–13	Washington	V. V. Skinner Publicity Chm.	1418 Good Hope Road, S.E., Washington 20
Thomas P. Hinman Mid-Winter Clinic	March 23–25	Atlanta	S. A. Garrett	Medical Arts Bldg., Atlanta
Academy of Denture Prosthetics	July 28–Aug. 3	Boston	I. L. Furnas Secy.	928 Silverado St., La Jolla, Calif.
Washington University, Dental Alumni, Eighty-First Annual Meeting	Feb. 21–22	St. Louis	V. P. Thompson Secy.	111 W. Lockwood Ave., Webster Groves, Mo.
Dental Hygienists Association of the City of New York	March 7	New York	E. Jaeffa Publicity Chm.	265 W. 94th St., New York
Northeastern Society of Orthodontists	March 10–11	New York	O. Jacobson Secy.	35 W. 81st St., New York

INTERNSHIPS, EXTERNSHIPS, RESIDENCIES AND FELLOWSHIPS

The Children's and Infants' Hospital (a Unit) of Boston. Address Paul K. Losch, 300 Longwood Ave., Boston.

The Children's Memorial Hospital, Chicago. Administrator, Mabel W. Binner, 707 Fullerton Ave., Chicago.

Columbia University, School of Dental and Oral Surgery. Associate Dean, Bion R. East, 630 W. 168th St., New York 32.

Eastman Dental Dispensary, Rochester, N. Y.

Fellowships for Research and Graduate Work in the Dental Sciences, University of Rochester. Dean, George H. Whipple.

The Forsyth Dental Infirmary for Children. Director, Percy R. Howe, 140 The Fenway, Boston.

International Grenfell Association. Staff Selection Committee, 156 Fifth Ave., New York.

Jewish Sanitarium and Hospital for Chronic Diseases. Director, Leonard Kohn, Dental Division, E. Forty-Ninth St. and Rutland Road, Brooklyn 3, N. Y.

Joseph Samuels Dental Clinic of the Rhode Island Hospital, Providence. Director, Ernest A. Charbonnel.

Notre Dame Bay Memorial Hospital, Twillingate, Newfoundland. Address John M. Konopka, 25 W. Independence St., Shamokin, Pa.

Richmond Freeman Memorial Clinic for Infants and Children, Dallas, Texas. Executive Director, Dora B. Foster, 3617 Maple Ave., Dallas.

University of Illinois, Graduate School. Secretary, Committee on Graduate Work in Medicine, Dentistry and Pharmacy, 1853 W. Polk St., Chicago 12.

University of Illinois, College of Dentistry. Isaac Schour, College of Dentistry, University of Illinois, 808 S. Wood St., Chicago 12.

Walter G. Zoller Memorial Dental Clinic, University of Chicago. Director, J. R. Blayney, 950 E. Fifty-Ninth St., Chicago 37